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Quarterly Demographic Estimates

April to June 2018

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Notice to readers

Estimates released in this publication are based on the 2016 Census counts adjusted for census net undercoverage and incompletely enumerated Indian reserves to which is added the estimated demographic growth for the period going from May 10, 2016 to the date of the estimate.

These estimates are not to be mistaken with the 2016 Census counts.

The analysis in this publication is based on preliminary data. These data will be revised over the coming years, and it is possible that some trends described in this publication will change as a result of these revisions. Therefore, this publication should be interpreted with caution.

Most of the components, used to produce preliminary population estimates, are estimated using demographic models or based on data sources less complete or reliable, albeit more timely, than those used for updated or final estimates.

Acknowledgements

The completion of this publication and the dissemination of the quarterly demographic estimates rest on the assiduous and meticulous work of the members of the Population Estimates Section of the Demography Division.

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Quarterly Demographic Estimates

Highlights

- On July 1, 2018, Canada's population was estimated at 37,058,856.
- Between April 1 and July 1, 2018, Canada's population grew by 168,687 (+0.5%), the second largest increase in absolute numbers for a single quarter during the study period from 1971 to 2018.[1]
- In the second quarter of 2018, Canada's population growth was mostly due to international migration (+138,978), a level never before seen for any quarter.
- Population growth was higher in Nunavut (+1.3%), in Yukon (+1.0%) and in Prince Edward Island (+0.8%) than in Canada.
- Preliminary population estimates for the last quarter show that Alberta recorded interprovincial migration gains (+842) for a second consecutive quarter, following 10 quarters of continuous interprovincial migratory losses.
- In Ontario, interprovincial migration was positive in the second quarter (+3,274), marking 12 consecutive quarters of gains in its exchanges with the other provinces.

1. The period covered by the current demographic accounting system began in July 1971.

Analysis

Canada's population continues to grow at a steady pace

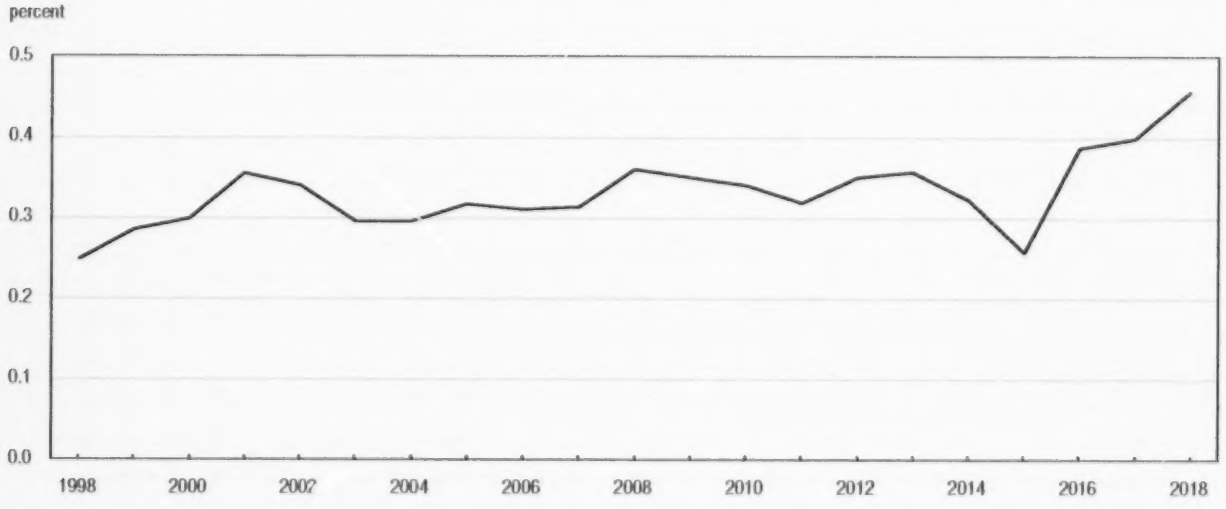
For the first time, the estimates in this publication are based on the 2016 Census counts adjusted for census net undercoverage and incompletely enumerated Indian reserves, to which is added the estimated population growth for the period from May 10, 2016, to the date of the estimate. The data starting from July 2001 were also revised.

The analysis in this publication is based on preliminary data. These data will be revised over the coming years, and it is possible that some trends described in this publication will change as a result of these revisions. Therefore, this publication should be interpreted with caution.

According to preliminary population estimates, Canada's population was 37,058,856 on July 1, 2018.

Between April 1 and July 1, 2018, the Canadian population increased by 168,687. This quarterly increase is the highest in absolute numbers for a second quarter during the study period from July 1971 to July 2018.[2] All quarters combined, the only time the increase was greater was between July 1 and October 1, 2017, when Canada recorded a significant increase in the number of non-permanent residents.[3] Moreover, Canada's population growth rate was 0.5% between April 1 and July 1, 2018, a level that had not been reached for a second quarter since 1989.[4]

Chart A1
Population growth rate, April to June, 1998 to 2018, Canada



Source: Statistics Canada, Demography Division.

2. The period covered by the current demographic accounting system began in July 1971. Thus, for the second quarter period, the data for the population estimates have been covered since 1972.
3. This increase was mainly on account of an increase in the number of study permit holders, but also in the number of work permit holders and, to a lesser extent, the number of refugee claimants.
4. A period marked by the introduction of the Immigration and Refugee Board of Canada and a new refugee determination system.

International migration continues to account for most of the population growth

Nationally, population growth is based on two factors: natural increase[5] and international migratory increase.[6] Provincial and territorial population estimates also factor in interprovincial migratory increase.

International migratory increase remained the main driver of Canada's population growth, with an estimated increase of 138,978 between April 1 and July 1, 2018. All quarters combined, this was the highest level seen during the study period from July 1971 to July 2018.[7] This increase is due to a rise in both the number of immigrants and the number of non-permanent residents.

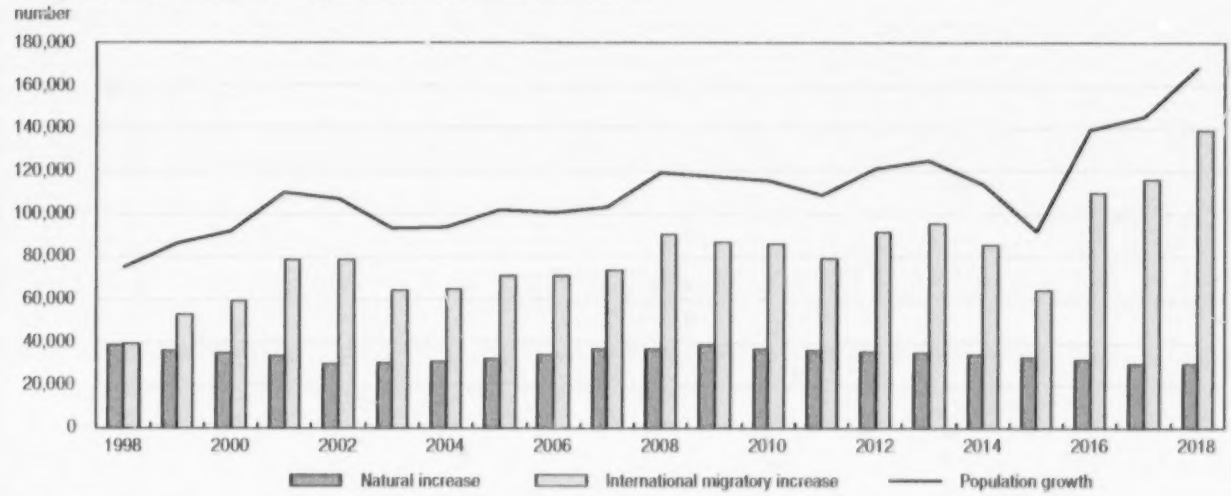
In the second quarter of 2018, the number of new immigrants was 87,661. During the study period (1971 to 2018), the only time Canada received more immigrants in three months was in the second quarter of 2016 (+88,302).[8]

Moreover, Canada posted an increase in the number of non-permanent residents (+60,446) in the second quarter of 2018. This increase was significantly higher than those observed in recent years. All quarters combined, the only time Canada had a higher net increase in non-permanent residents was recorded in the third quarter of 2017 (+79,289).[9] The increase in non-permanent residents between April 1 and July 1, 2018 was primarily the result of an increase in the number of work permit holders and, to a lesser extent, in the number of study permit holders and refugee claimants.[10] The components of net emigration (emigration, return emigration and net temporary emigration) remained stable (-9,129).

According to preliminary estimates, natural increase in the second quarter of 2018 was 29,709, the third lowest estimated level for a second quarter.[11] Natural increase is the difference between 97,706 births and 67,997 deaths. The last time the number of births for a second quarter was higher was in 1995. However, the number of deaths has never been as high for a second quarter. In the coming years, natural increase is expected to continue decreasing, mainly as a result of population aging which results in an increase in the number of deaths each year.

5. Natural increase is the difference between the number of births and the number of deaths.
6. International migratory increase basically refers to the total number of moves between Canada and abroad that result in a change in the usual place of residence. It is calculated by adding immigrants, returning emigrants and net non-permanent residents, then subtracting emigrants and net temporary emigration.
7. The period covered by the current demographic accounting system began in July 1971. Thus, for the second quarter period, the data for the population estimates have been covered since 1972.
8. The arrival of Syrian refugees accounted for part of the increase in the number of immigrants recorded in the first two quarters of 2016, admitted directly as immigrants under the program related to Canada's commitment to resettle Syrian refugees.
9. This increase was mostly the result of an increase in the number of study permit holders, but also of an increase in the number of work permit holders and, to a lesser extent, the number of refugee claimants.
10. There are three main categories of non-permanent residents: work permit holders, study permit holders and refugee claimants. Net non-permanent residents is calculated by subtracting the number of non-permanent residents estimated at the beginning of the period from the number estimated at the end of the period.
11. Since the beginning of the period covered by the current demographic accounting system (July 1971). The first time the second quarter appeared in the current demographic accounting system was 1972.

Chart A2
Factors of population growth, April to June, 1998 to 2018, Canada



Note: Until 2016 inclusively, population growth is not equal to the sum of natural increase and international migratory increase because residual deviation must also be considered in the calculation.
Source: Statistics Canada, Demography Division.

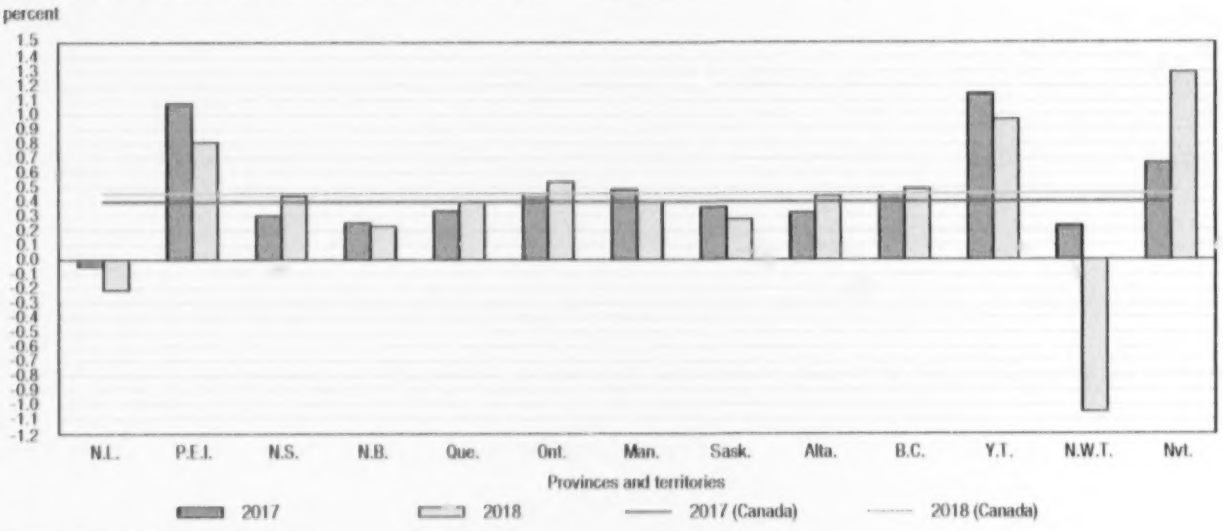
Population growth was everywhere, except in Newfoundland and Labrador and the Northwest Territories

The population grew[12] in all provinces and territories in the second quarter of 2018, except in Newfoundland and Labrador (-0.2%) and the Northwest Territories (-1.0%). Nunavut (+1.3%), Yukon (+1.0%) and Prince Edward Island (+0.8%) had higher population growth rates than Canada's (+0.5%).

Compared with the same period last year, an increase in the population growth rate was observed in Nova Scotia, Quebec, Alberta and Nunavut. The data also show a shift in the growth rate from positive to negative in the Northwest Territories, and from negligible to negative in Newfoundland and Labrador.

12. A growth rate higher than -0.1% and lower than 0.1% is considered not significant and relatively stable.

Chart A3
Population growth rate, April to June, 2017 and 2018, Canada, provinces and territories



Source: Statistics Canada, Demography Division.

International migration is the main source of population growth in provinces

During the second quarter of 2018, international migratory increase was the main driver of population growth in all provinces that posted a population gain, and in Yukon. Consequently, international migratory increase in the second quarter either peaked or has rarely been this high everywhere except in Newfoundland and Labrador, Alberta, the Northwest Territories and Nunavut. Furthermore, along with natural increase, international migration offset interprovincial migratory losses in Quebec, Manitoba and Saskatchewan. It also compensated for natural decrease (more deaths than births) in Nova Scotia and New Brunswick.

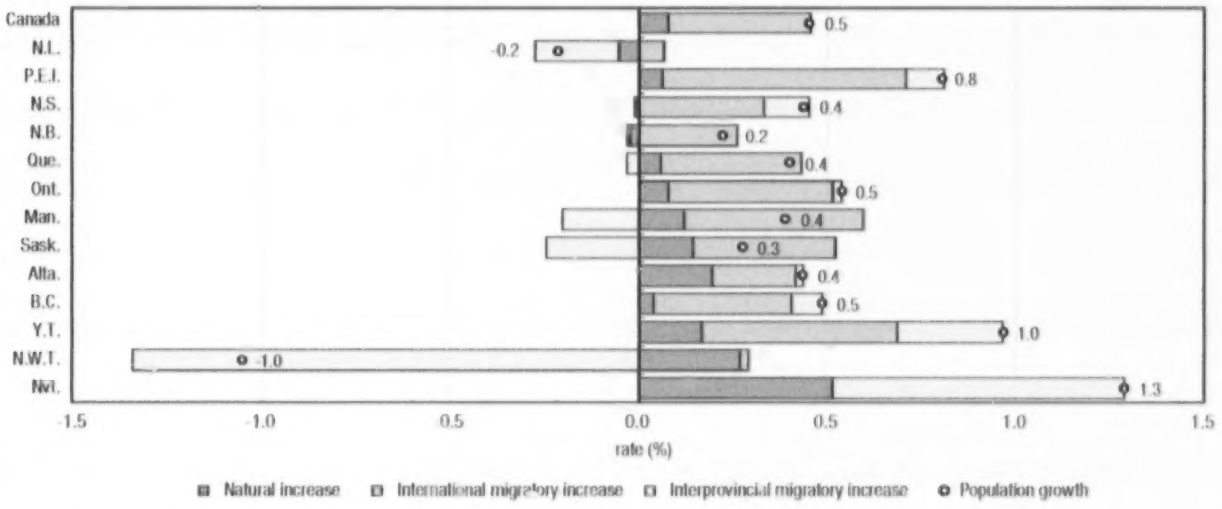
In Alberta, international migratory increase accounted for 51% of the population growth, while natural increase represented 45% and interprovincial migration 4%. Nunavut and the Northwest Territories continued to post the highest rates of natural increase, with 0.5% and 0.3% respectively. Fertility levels in these two territories are among the highest in Canada.[13]

In Quebec, Ontario and British Columbia, the three most populous provinces, an increase in the number of non-permanent residents accounted for part of the international migratory increase. Quebec posted a gain of 19,506 non-permanent residents, a level never before seen in any quarter.[14] Ontario recorded an unprecedented increase in the number of non-permanent residents in a second quarter (+28,329), as did British Columbia, with a gain of 8,189 non-permanent residents. The Atlantic provinces (except Newfoundland and Labrador), Manitoba and Yukon also posted a peak in the number of non-permanent residents.

13. Along with Saskatchewan and Manitoba. Source: Statistics Canada, Table 13-10-0418-01 (formerly CANSIM 102-4505). https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310041801 (accessed on September 4, 2018).

14. Since the beginning of the period covered by the current demographic accounting system (July 1971). The first time the second quarter appeared in the current demographic accounting system was 1972.

Chart A4
Factors of population growth, April to June, 2018, Canada, provinces and territories



Source: Statistics Canada, Demography Division.

Table A1
Population on July 1st 2018 and population growth, second quarter, 2017 and 2018, Canada, provinces and territories

	Population	Population growth for the second quarter			
		2017		2018	
		number	rate (%)	number	rate (%)
Canada	37,058,856	145,480	0.40	168,687	0.46
N.L.	525,355	-249	-0.05	-1,107	-0.21
P.E.I.	153,244	1,620	1.08	1,235	0.81
N.S.	959,942	2,890	0.30	4,234	0.44
N.B.	770,633	1,926	0.25	1,768	0.23
Que.	8,390,499	27,822	0.34	33,800	0.40
Ont.	14,322,757	63,960	0.46	76,722	0.54
Man.	1,352,154	6,414	0.48	5,303	0.39
Sask.	1,162,062	4,155	0.36	3,226	0.28
Alta.	4,307,110	13,711	0.32	18,783	0.44
B.C.	4,991,687	22,427	0.46	24,312	0.49
Y.T.	40,476	451	1.14	389	0.97
N.W.T.	44,541	104	0.23	-470	-1.05
Nvt.	38,396	249	0.67	492	1.29

Source: Statistics Canada, Demography Division.

British Columbia, Ontario, Nova Scotia and Alberta, gain in their migratory exchanges with the other provinces and territories

British Columbia had the strongest interprovincial gains (+4,102) in the second quarter of 2018, continuing a trend spanning the last 21 quarters of uninterrupted gains in interprovincial migration. In its exchanges with the other provinces and territories, British Columbia's migratory gains came primarily from the Prairie provinces.

Among all provinces and territories, Ontario posted the second highest interprovincial migratory increase in absolute numbers. Net interprovincial migration in the province was positive (+3,274) for a twelfth straight quarter, a first since the early 2000s. The province gained in its exchanges with Quebec, Manitoba, Saskatchewan and Newfoundland and Labrador.

In Nova Scotia, net interprovincial migration remained positive (+1,182) for an eleventh consecutive quarter, a first since 1985. The province gained in its exchanges with all provinces, particularly at the expense of Ontario, Newfoundland and Labrador and British Columbia.

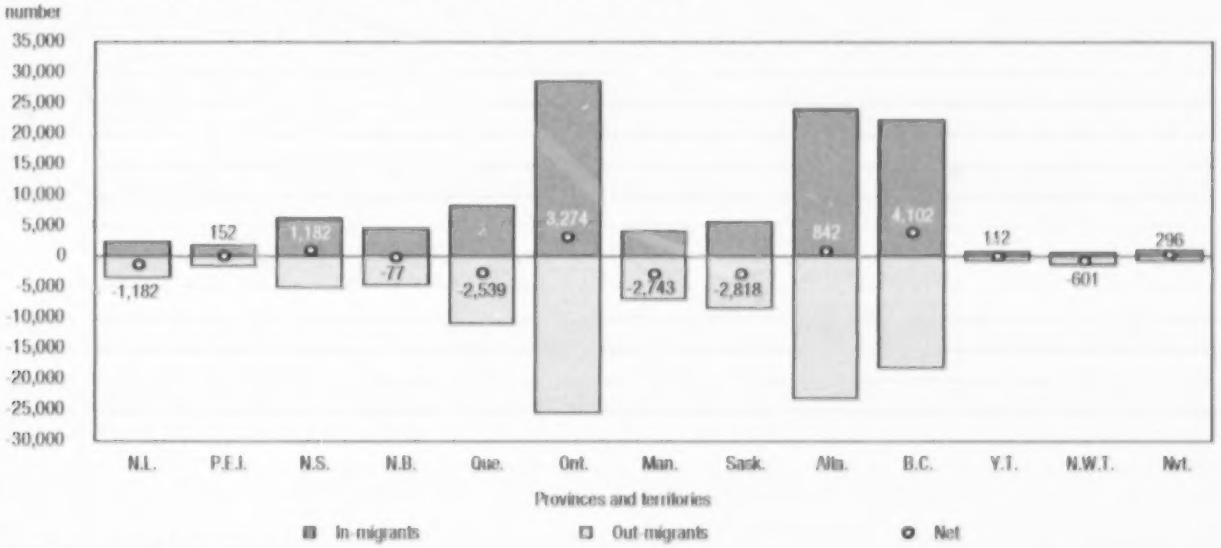
According to preliminary population estimates, Alberta had positive net interprovincial migration (+842) for a second consecutive quarter, following 10 quarters of interprovincial migration losses. In its exchanges with the other provinces and territories, Alberta's migratory gains came primarily from Saskatchewan, Manitoba, Newfoundland and Labrador and the Northwest Territories. These gains were partially offset by migratory losses to British Columbia.

In Quebec, interprovincial migratory increase remained negative (-2,539). All quarters combined, the last time net interprovincial migration was greater than zero in Quebec (+15) was in the fourth quarter of 2009.

The second quarter of 2018 marked nine consecutive quarters of interprovincial migratory losses for Newfoundland and Labrador (-1,182). The last time the province had such a long period of quarterly deficits was from 1991 to 2007. Migratory losses with Ontario, Alberta and Nova Scotia were especially pronounced.

Manitoba (-2,743) saw its largest interprovincial migratory losses, continuing a period of ongoing deficits since the second quarter of 2004. Saskatchewan (-2,818) also had its largest interprovincial migration losses, which have been accumulating since the third quarter of 2013. Both provinces had more significant outflows to Ontario, Alberta and British Columbia.

Chart A5
Interprovincial migration, April to June 2018, provinces and territories



Source: Statistics Canada, Demography Division.

Statistical tables

Table 1.1
Quarterly population estimates, Canada, provinces and territories - Population

	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	number													
2011														
July 1st	34,339,328	524,999	143,963	944,274	755,705	8,005,090	13,261,381	1,233,649	1,066,026	3,789,030	4,502,104	35,411	43,504	34,192
October 1st	34,457,998	525,936	144,378	945,016	756,420	8,021,860	13,308,659	1,238,019	1,070,687	3,807,726	4,525,684	35,668	43,593	34,352
2012														
January 1st	34,516,352	526,215	144,310	944,307	757,278	8,029,498	13,323,332	1,242,141	1,074,265	3,825,072	4,536,084	35,782	43,648	34,420
April 1st	34,592,779	525,655	144,472	943,746	757,270	8,039,492	13,348,263	1,245,692	1,077,892	3,847,722	4,548,438	35,843	43,701	34,593
July 1st	34,714,222	526,345	144,530	943,635	758,378	8,061,101	13,390,632	1,249,975	1,083,755	3,874,548	4,566,769	36,234	43,648	34,672
October 1st	34,836,008	527,180	144,520	943,341	758,673	8,078,388	13,434,943	1,254,178	1,088,959	3,900,333	4,590,545	36,425	43,681	34,842
2013														
January 1st	34,883,119	527,248	144,175	942,598	758,298	8,082,771	13,444,704	1,257,940	1,091,547	3,920,499	4,598,255	36,373	43,737	34,974
April 1st	34,958,216	527,313	143,948	941,230	758,132	8,090,916	13,467,829	1,260,834	1,094,390	3,946,798	4,611,648	36,313	43,867	34,998
July 1st	35,082,954	527,114	144,094	940,434	758,544	8,110,880	13,510,781	1,264,620	1,099,736	3,981,011	4,630,077	36,521	43,805	35,337
October 1st	35,211,866	528,117	144,103	940,105	758,670	8,124,660	13,558,528	1,268,428	1,103,730	4,010,903	4,658,875	36,448	43,756	35,543
2014														
January 1st	35,249,639	528,242	143,996	939,867	759,018	8,125,478	13,562,583	1,271,562	1,106,374	4,029,951	4,666,788	36,393	43,800	35,587
April 1st	35,323,533	527,498	143,984	938,913	758,876	8,132,425	13,582,747	1,274,407	1,109,631	4,054,280	4,684,490	36,682	43,794	35,806
July 1st	35,437,435	528,159	144,283	938,545	758,976	8,150,183	13,617,553	1,279,014	1,112,979	4,083,648	4,707,103	37,137	43,884	35,971
October 1st	35,559,047	528,461	144,538	938,972	759,524	8,165,447	13,661,314	1,283,366	1,116,203	4,106,056	4,737,725	37,272	44,064	36,105
2015														
January 1st	35,575,187	528,361	144,368	938,296	759,617	8,163,132	13,657,737	1,286,453	1,118,181	4,116,047	4,745,468	37,168	44,140	36,219
April 1st	35,611,271	528,063	144,259	936,271	758,948	8,163,063	13,669,860	1,288,094	1,118,806	4,128,300	4,757,759	37,372	44,193	36,283
July 1st	35,702,908	528,117	144,546	936,525	758,842	8,175,272	13,707,118	1,292,227	1,120,967	4,144,491	4,776,388	37,690	44,237	36,488
October 1st	35,822,894	528,696	144,894	938,320	759,778	8,190,014	13,757,688	1,297,329	1,124,919	4,159,519	4,802,955	37,751	44,428	36,603
2016														
January 1st	35,871,136	528,800	145,202	938,690	760,580	8,193,624	13,773,629	1,302,544	1,127,773	4,169,830	4,811,465	37,770	44,507	36,722
April 1st	35,970,303	529,063	145,784	940,382	762,289	8,204,085	13,816,545	1,307,689	1,131,147	4,181,765	4,832,155	38,042	44,590	36,767
July 1st	36,109,487	529,426	146,969	942,790	763,350	8,225,950	13,875,394	1,314,139	1,135,987	4,196,061	4,859,250	38,547	44,649	36,975
October 1st	36,256,107	529,968	147,948	946,103	764,878	8,249,071	13,945,524	1,320,057	1,140,773	4,210,052	4,881,391	38,745	44,556	37,041
2017														
January 1st	36,309,132	529,491	148,202	946,061	764,657	8,255,776	13,970,658	1,324,455	1,143,480	4,219,363	4,886,352	38,833	44,626	37,178
April 1st	36,394,788	528,816	148,946	947,790	764,926	8,269,895	14,007,485	1,328,982	1,146,627	4,230,284	4,899,725	39,177	44,832	37,303
July 1st	36,540,268	528,567	150,566	950,680	766,852	8,297,717	14,071,445	1,335,396	1,150,782	4,243,995	4,922,152	39,628	44,936	37,552
October 1st	36,712,658	528,463	151,477	954,374	768,212	8,329,664	14,153,806	1,340,776	1,155,034	4,262,642	4,945,559	39,781	45,097	37,773
2018														
January 1st	36,786,021	527,609	151,535	954,611	768,229	8,341,475	14,190,680	1,344,385	1,156,964	4,274,054	4,953,906	39,922	44,942	37,709
April 1st	36,890,169	526,462	152,009	955,708	768,865	8,356,699	14,246,035	1,346,851	1,158,836	4,288,327	4,967,375	40,087	45,011	37,904
July 1st	37,058,856	525,355	153,244	959,942	770,633	8,390,499	14,322,757	1,352,154	1,162,062	4,307,110	4,991,687	40,476	44,541	38,396

Note: Estimates are intercensal final up to April 1, 2016, final postcensal on July 1, 2016 updated postcensal from October 1, 2016 to April 1, 2018 and preliminary postcensal from July 1, 2018.
Source: Statistics Canada, Demography Division.

Table 1.2
Quarterly population estimates, Canada, provinces and territories - Total growth in percentage

	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	percent													
2011														
July to September	0.34	0.18	0.29	0.08	0.09	0.21	0.36	0.35	0.44	0.49	0.52	0.72	0.20	0.47
October to December	0.17	0.05	-0.05	-0.08	0.11	0.10	0.11	0.33	0.33	0.45	0.23	0.32	0.13	0.20
2012														
January to March	0.22	-0.11	0.11	-0.06	0.00	0.12	0.19	0.29	0.34	0.59	0.27	0.17	0.12	0.50
April to June	0.35	0.13	0.04	-0.01	0.15	0.27	0.32	0.34	0.54	0.69	0.40	1.08	-0.12	0.23
July to September	0.35	0.16	-0.01	-0.03	0.04	0.21	0.33	0.34	0.48	0.66	0.52	0.53	0.08	0.49
October to December	0.14	0.01	-0.24	-0.08	-0.05	0.05	0.07	0.30	0.24	0.52	0.17	-0.14	0.13	0.38
2013														
January to March	0.22	0.01	-0.16	-0.15	-0.02	0.10	0.17	0.23	0.26	0.67	0.29	-0.17	0.30	0.07
April to June	0.36	-0.04	0.10	-0.08	0.05	0.25	0.32	0.30	0.49	0.86	0.40	0.57	-0.14	0.96
July to September	0.37	0.19	0.01	-0.03	0.02	0.17	0.35	0.30	0.36	0.75	0.62	-0.20	-0.11	0.58
October to December	0.11	0.02	-0.07	-0.03	0.05	0.01	0.03	0.25	0.24	0.47	0.17	-0.15	0.10	0.12
2014														
January to March	0.21	-0.14	-0.01	-0.10	-0.02	0.09	0.15	0.22	0.29	0.60	0.38	0.79	-0.01	0.61
April to June	0.32	0.13	0.21	-0.04	0.01	0.22	0.26	0.36	0.30	0.72	0.48	1.23	0.21	0.46
July to September	0.34	0.06	0.18	0.05	0.07	0.19	0.32	0.34	0.29	0.55	0.65	0.36	0.41	0.37
October to December	0.05	-0.02	-0.12	-0.07	0.01	-0.03	-0.03	0.24	0.18	0.24	0.16	-0.28	0.17	0.32
2015														
January to March	0.10	-0.06	-0.08	-0.22	-0.09	0.00	0.09	0.13	0.06	0.30	0.26	0.55	0.12	0.18
April to June	0.26	0.01	0.20	0.03	-0.01	0.15	0.27	0.32	0.19	0.39	0.39	0.85	0.10	0.56
July to September	0.34	0.11	0.24	0.19	0.12	0.18	0.37	0.39	0.35	0.36	0.55	0.16	0.43	0.31
October to December	0.13	0.02	0.21	0.04	0.11	0.04	0.12	0.40	0.25	0.25	0.18	0.05	0.18	0.32
2016														
January to March	0.28	0.05	0.40	0.18	0.22	0.13	0.31	0.39	0.30	0.29	0.43	0.72	0.19	0.12
April to June	0.39	0.07	0.81	0.26	0.14	0.27	0.43	0.49	0.43	0.34	0.56	1.32	0.13	0.56
July to September	0.41	0.10	0.66	0.35	0.20	0.28	0.50	0.45	0.42	0.33	0.45	0.51	-0.21	0.18
October to December	0.15	-0.09	0.17	0.00	-0.03	0.08	0.18	0.33	0.24	0.22	0.10	0.23	0.16	0.37
2017														
January to March	0.24	-0.13	0.50	0.18	0.04	0.17	0.26	0.34	0.27	0.26	0.27	0.88	0.46	0.34
April to June	0.40	-0.05	1.08	0.30	0.25	0.34	0.46	0.48	0.36	0.32	0.46	1.14	0.23	0.67
July to September	0.47	-0.02	0.60	0.39	0.18	0.38	0.58	0.40	0.37	0.44	0.47	0.39	0.36	0.59
October to December	0.20	-0.16	0.04	0.02	0.00	0.14	0.26	0.27	0.17	0.27	0.17	0.35	-0.34	-0.17
2018														
January to March	0.28	-0.22	0.31	0.11	0.08	0.18	0.39	0.18	0.16	0.33	0.27	0.41	0.15	0.52
April to June	0.46	-0.21	0.81	0.44	0.23	0.40	0.54	0.39	0.28	0.44	0.49	0.97	-1.05	1.29

Note: Total growth is final up to June 2016, updated from July 2016 to March 2018 and preliminary from April 2018.
Source: Statistics Canada, Demography Division.

Table 1.3
Quarterly population estimates, Canada, provinces and territories - Total growth

	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	number													
2011														
July to September	118,670	937	415	742	715	16,770	47,278	4,370	4,661	18,696	23,580	257	89	160
October to December	58,354	279	-68	-709	858	7,638	14,673	4,122	3,578	17,346	10,400	114	55	68
2012														
January to March	76,427	-560	162	-561	-8	9,994	24,931	3,551	3,627	22,650	12,354	61	53	173
April to June	121,443	690	58	-111	1,108	21,609	42,369	4,283	5,863	26,826	18,331	391	-53	79
July to September	121,786	835	-10	-294	295	17,287	44,311	4,203	5,204	25,785	23,776	191	33	170
October to December	47,111	68	-345	-743	-375	4,383	9,761	3,762	2,588	20,166	7,710	-52	56	132
2013														
January to March	75,097	65	-227	-1,368	-166	8,145	23,125	2,894	2,843	26,299	13,393	-60	130	24
April to June	124,738	-199	146	-796	412	19,964	42,952	3,786	5,346	34,213	18,429	208	-62	339
July to September	128,912	1,003	9	-329	126	13,780	47,747	3,808	3,994	29,892	28,798	-73	-49	206
October to December	37,773	125	-107	-238	348	818	4,055	3,134	2,644	19,048	7,913	-55	44	44
2014														
January to March	73,894	-744	-12	-954	-142	6,947	20,164	2,845	3,257	24,329	17,702	289	-6	219
April to June	113,902	661	299	-368	100	17,758	34,806	4,607	3,348	29,368	22,613	455	90	165
July to September	121,612	302	255	427	548	15,264	43,761	4,352	3,224	22,408	30,622	135	180	134
October to December	16,140	-100	-170	-676	93	-2,315	-3,577	3,087	1,978	9,991	7,743	-104	76	114
2015														
January to March	36,084	-298	-109	-2,025	-669	-69	12,123	1,641	625	12,253	12,291	204	53	64
April to June	91,637	54	287	254	-106	12,209	37,258	4,133	2,161	16,191	18,629	318	44	205
July to September	119,986	579	348	1,795	936	14,742	50,570	5,102	3,952	15,028	26,567	61	191	115
October to December	48,242	104	308	370	802	3,610	15,941	5,215	2,834	10,311	8,510	19	79	119
2016														
January to March	99,167	263	582	1,692	1,709	10,461	42,916	5,145	3,374	11,935	20,690	272	83	45
April to June	139,184	363	1,185	2,408	1,061	21,865	58,849	6,450	4,840	14,296	27,095	505	59	208
July to September	146,620	542	979	3,313	1,528	23,121	70,130	5,918	4,786	13,991	22,141	198	-93	66
October to December	53,025	-477	254	-42	-221	6,705	25,134	4,398	2,707	9,311	4,961	88	70	137
2017														
January to March	85,656	-675	744	1,729	269	14,119	36,827	4,527	3,147	10,921	13,373	344	206	125
April to June	145,480	-249	1,620	2,890	1,926	27,822	63,960	6,414	4,155	13,711	22,427	451	104	249
July to September	172,390	-104	911	3,694	1,360	31,947	82,361	5,380	4,252	18,647	23,407	153	161	221
October to December	73,363	-854	58	237	17	11,811	36,874	3,609	1,930	11,412	8,347	141	-155	-64
2018														
January to March	104,148	-1,147	474	1,097	636	15,224	55,355	2,466	1,872	14,273	13,469	165	69	195
April to June	168,687	-1,107	1,235	4,234	1,768	33,800	76,722	5,303	3,226	18,783	24,312	389	-470	492

Note: Total growth is final up to June 2016, updated from July 2016 to March 2018 and preliminary from April 2018.
Source: Statistics Canada, Demography Division.

Table 2
Quarterly population estimates and factors of demographic growth - Canada

	Population at beginning period	Natural increase	Net interprovincial migration	Net international migration	Total net migration	Residual deviation	Total growth	Total growth rate
	number							percent
2011								
July to September	34,339,328	43,470	0	80,755	80,755	5,555	118,670	0.34
October to December	34,457,998	30,279	0	33,633	33,633	5,558	58,354	0.17
2012								
January to March	34,516,352	27,101	0	54,819	54,819	5,493	76,427	0.22
April to June	34,592,779	35,580	0	91,357	91,357	5,494	121,443	0.35
July to September	34,714,222	42,836	0	84,505	84,505	5,555	121,786	0.35
October to December	34,836,008	29,756	0	22,909	22,909	5,554	47,111	0.14
2013								
January to March	34,883,119	22,702	0	57,829	57,829	5,434	75,097	0.22
April to June	34,958,216	34,657	0	95,577	95,577	5,496	124,738	0.36
July to September	35,082,954	41,836	0	92,630	92,630	5,554	128,912	0.37
October to December	35,211,866	28,790	0	14,536	14,536	5,553	37,773	0.11
2014								
January to March	35,249,639	24,522	0	54,806	54,806	5,434	73,894	0.21
April to June	35,323,533	34,081	0	85,318	85,318	5,497	113,902	0.32
July to September	35,437,435	41,597	0	85,569	85,569	5,554	121,612	0.34
October to December	35,559,047	25,079	0	-3,383	-3,383	5,556	16,140	0.05
2015								
January to March	35,575,187	17,505	0	24,011	24,011	5,432	36,084	0.10
April to June	35,611,271	32,973	0	64,157	64,157	5,493	91,637	0.26
July to September	35,702,908	40,786	0	84,757	84,757	5,557	119,986	0.34
October to December	35,822,894	26,795	0	27,002	27,002	5,555	48,242	0.13
2016								
January to March	35,871,136	22,021	0	82,640	82,640	5,494	99,167	0.28
April to June	35,970,303	31,890	0	109,648	109,648	2,354	139,184	0.39
July to September	36,109,487	39,655	0	106,965	106,965	...	146,620	0.41
October to December	36,256,107	22,323	0	30,702	30,702	...	53,025	0.15
2017								
January to March	36,309,132	18,404	0	67,252	67,252	...	85,656	0.24
April to June	36,394,788	29,649	0	115,831	115,831	...	145,480	0.40
July to September	36,540,268	37,993	0	134,397	134,397	...	172,390	0.47
October to December	36,712,658	21,316	0	52,047	52,047	...	73,363	0.20
2018								
January to March	36,786,021	16,823	0	87,325	87,325	...	104,148	0.28
April to June	36,890,169	29,709	0	138,978	138,978	...	168,687	0.46
July to September	37,058,856	...	...	...	...	...	...	...

... not available

Note: See "Data quality, concepts and methodology — Explanatory notes for the tables" section.

Source: Statistics Canada, Demography Division.

Table 3
Quarterly estimates of demographic components - Canada

	Natural increase		Net interprovincial migration		Net international migration					
	Births	Deaths	In-migrants	Out-migrants	Immigrants	Emigrants	Returning emigrants	Net temporary emigrants	Net non-permanent residents	Residual deviation
	number									
2011										
July to September	100,674	57,204	89,862	89,862	71,864	22,222	14,070	7,861	24,904	5,555
October to December	91,731	61,452	55,322	55,322	59,603	14,988	6,027	6,387	-10,622	5,558
2012										
January to March	91,145	64,044	69,238	69,238	55,563	14,120	5,984	6,214	13,606	5,493
April to June	95,290	59,710	90,003	90,003	73,006	14,063	11,089	6,201	27,526	5,494
July to September	101,178	58,312	85,820	85,820	66,902	20,315	15,023	7,693	30,588	5,555
October to December	94,256	64,500	47,531	47,531	62,338	13,375	5,663	6,204	-25,513	5,554
2013										
January to March	90,860	68,158	62,699	62,699	58,253	14,286	5,622	6,399	14,639	5,434
April to June	95,313	60,656	96,253	96,253	75,608	14,153	10,686	6,371	29,807	5,496
July to September	100,839	59,003	81,855	81,855	65,406	19,902	16,003	7,497	38,620	5,554
October to December	93,311	64,521	52,761	52,761	59,771	14,368	5,556	6,341	-30,082	5,553
2014										
January to March	91,423	66,901	67,097	67,097	64,458	14,680	5,388	6,406	6,046	5,434
April to June	96,708	62,627	102,756	102,756	78,289	14,772	9,942	6,424	18,283	5,497
July to September	102,468	60,871	79,966	79,966	65,542	21,768	15,647	7,741	33,889	5,554
October to December	93,501	68,422	51,170	51,170	52,007	14,002	6,027	6,167	-41,248	5,556
2015										
January to March	90,662	73,157	74,452	74,452	51,123	14,989	5,431	6,369	-11,185	5,432
April to June	96,684	63,711	108,765	108,765	72,091	15,078	11,353	6,388	2,179	5,493
July to September	101,749	60,963	87,901	87,901	78,902	23,493	16,797	7,948	20,499	5,557
October to December	93,297	66,502	47,708	47,708	69,741	15,385	5,855	6,352	-26,857	5,555
2016										
January to March	91,963	69,942	70,384	70,384	86,247	15,111	5,951	6,302	11,855	5,494
April to June	96,570	64,680	98,130	98,130	88,302	13,904	11,057	6,062	30,255	2,354
July to September	102,523	62,868	83,942	83,942	68,242	23,775	16,999	8,043	53,542	...
October to December	92,046	69,723	43,031	43,031	53,614	15,569	5,924	6,430	-6,837	...
2017										
January to March	92,140	73,736	67,133	67,133	72,839	15,291	6,022	6,376	10,058	...
April to June	96,478	66,829	95,905	95,905	78,012	14,070	11,188	6,133	46,834	...
July to September	102,612	64,619	81,606	81,606	70,109	24,066	17,206	8,141	79,289	...
October to December	92,781	71,465	51,604	51,604	65,530	15,759	5,999	6,508	2,785	...
2018										
January to March	92,678	75,855	72,055	72,055	79,957	15,480	6,095	6,456	23,209	...
April to June	97,706	67,997	110,243	110,243	87,661	14,245	11,326	6,210	60,446	...

... not applicable

Note: See "Data quality, concepts and methodology — Explanatory notes for the tables" section.
Source: Statistics Canada, Demography Division.

Table 4
Quarterly estimates of interprovincial migrants by province or territory of origin and destination, Canada, April to June 2018

	Destination												
Origin	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	number												
N.L.	...	100	480	205	48	1,110	46	57	1,107	273	27	0	56
P.E.I.	88	...	240	134	71	677	27	12	132	183	0	0	14
N.S.	244	236	...	807	218	1,816	104	100	902	479	40	72	35
N.B.	145	167	907	...	586	1,354	107	165	706	370	0	5	20
Que.	112	35	221	592	...	7,229	119	227	998	1,198	41	6	86
Ont.	679	741	2,277	1,467	4,971	...	1,160	1,026	6,194	6,220	102	254	387
Man.	61	14	200	74	280	2,118	...	742	1,699	1,548	62	28	27
Sask.	55	54	144	45	159	1,791	641	...	3,799	1,701	82	52	16
Alta.	687	220	956	707	898	6,021	1,037	2,498	...	9,792	124	129	127
B.C.	172	143	697	333	997	6,022	820	731	7,927	...	174	43	79
Y.T.	0	0	11	26	28	122	0	69	60	247	...	23	46
N.W.T.	30	9	51	28	43	258	15	58	477	172	67	...	33
Nvt.	54	11	51	37	26	234	34	36	37	57	25	28	...
In-migrants	2,327	1,730	6,235	4,455	8,325	28,752	4,110	5,721	24,038	22,240	744	640	926
Out-migrants	3,509	1,578	5,053	4,532	10,864	25,478	6,853	8,539	23,196	18,138	632	1,241	630
Net	-1,182	152	1,182	-77	-2,539	3,274	-2,743	-2,818	842	4,102	112	-601	296
Total number of migrants:							**110,243**						

... not applicable

Note: Preliminary estimates based on data from the Canada child benefit (CCB) program and $_{a}F$ factors calculated using 2014/2015, 2015/2016 and 2016/2017 tax file data from Canada Revenue Agency.

Source: Statistics Canada, Demography Division.

Data quality, concepts and methodology

Methodology

On September 27, 2018, revisions were made to the population estimates. Population estimates from July 2011 to July 2018 were revised based on the 2016 Census counts adjusted for census net undercoverage and for partially enumerated Indian reserves. Historical revisions were also made to some components of demographic growth therefore affecting population estimates starting in July 2001.

This section describes the concepts, data sources and methodology used to produce the population estimates. Population estimates are produced to measure the population counts according to various characteristics and geographies between two censuses. The demographic estimates are the official population estimates at the national, provincial and territorial levels.

Postcensal estimates are based on the 2016 Census.

Population Estimates

Estimates of the total population

Types of estimates

Population estimates can be either intercensal or postcensal. Intercensal estimates are produced using the counts from two consecutive censuses adjusted for census net undercoverage (CNU)[1] and postcensal estimates. The production of intercensal estimates involves updating the postcensal estimates using the counts from a new census adjusted for CNU.[1]

Postcensal estimates are produced using data from the most recent census adjusted for CNU[1] and the components of demographic growth. In terms of timeliness, postcensal estimates are more up-to-date than data from the most recent census adjusted for CNU,[1] but as they get farther from the date of that census, they become more variable.

Levels of estimates

The production of the population estimates between censuses entails the use of data from administrative files or surveys. The quality of population estimates therefore depends on the availability of a number of administrative data files that are provided to Statistics Canada by Canadian and foreign government departments. Since some components are not available until several months after the reference date, three kinds of postcensal estimates are produced preliminary postcensal (PP), updated postcensal (PR) and final postcensal (PD). The time lag between the reference date and the release date is three months for preliminary estimates and two to three years for final estimates. Though it requires more vigilance on the part of users, the production of three successive series of postcensal estimates is the strategy that best satisfies the need for both timeliness and accuracy of the estimates. All tables indicate the level of the estimates they contain.

Calculation of postcensal population estimates

Population estimates – preliminary, updated and final – are produced by the component method. This method consists of taking the population figures from the most recent census, adjusted for the CNU[1] (census undercoverage minus census overcoverage), and adding or subtracting the number of births, deaths, and components of international and interprovincial migration.

A. Provincial / territorial estimates of total population

Population estimates are produced for the provinces and territories first; then they are summed to obtain an estimate of the population of Canada.

The component-method formula for estimating the total provincial / territorial populations is as follows:

$$P_{(t+i)} = P_{(t)} + B_{(t,t+i)} - D_{(t,t+i)} + I_{(t,t+i)} - \left[E_{(t,t+i)} + \Delta TE_{(t,t+i)} \right] + RE_{(t,t+i)} + \Delta NPR_{(t,t+i)} + \Delta \text{Ninter}_{(t,t+i)} - \text{Resid}_{(t,t+i)}$$

where, for each province and territory:

(t,t+i)	interval between times t and t+i;
$P_{(t+i)}$	estimate of the population at time t+i;
$P_{(t)}$	base population at time t (census adjusted for (CNU)[1] or most recent estimate);
B	number of births;
D	number of deaths;
I	number of immigrants;
E	number of emigrants;
ΔTE	net temporary emigration;
RE	number of returning emigrants;
ΔNPR	net non-permanent residents;
ΔNinter	net interprovincial migration;
Resid	residual deviation (for intercensal estimates).

B. Levels of estimates

The difference between preliminary[2] and final postcensal population estimates lies in the timeliness of the components. When all the components are preliminary, the population estimate is described as preliminary postcensal (PP). When they are all final, the estimate is referred to as final postcensal (PD). Any other combination of levels is referred to as updated postcensal (PR).

Base population and components of demographic growth

A. Base population

The base populations are derived from the quinquennial censuses between 1971 and 2016. The population universe of the 2016[3] Census includes the following groups:

- Canadian citizens (by birth or by naturalization) and immigrants with a usual place of residence in Canada;
- Canadian citizens (by birth or by naturalization) and immigrants who are abroad either on a military base or attached to a diplomatic mission;
- Canadian citizens (by birth or by naturalization) and immigrants at sea or in port aboard merchant vessels under Canadian registry or Canadian government vessels;
- persons with a usual place of residence in Canada who are claiming refugee status and the family members living with them;
- persons with a usual place of residence in Canada who hold study permits and the family members living with them;
- persons with a usual place of residence in Canada who hold work permits and the family members living with them.

For census purposes, the last three groups are referred to as non-permanent residents (NPR). They have been included in the census universe since 1991 but foreign residents are not included. Foreign residents are persons who belong to the following groups:

- government representatives of another country attached to the embassy, high commission or other diplomatic body of that country in Canada, and members of their families living with them;
- members of the Armed Forces of another country who are stationed in Canada, and family members living with them;
- residents of another country visiting Canada temporarily (for example, a foreign visitor on vacation or on business, with or without a visitor's permit).

These base populations are adjusted as follows:

- adjustment of the population for CNU;
- addition of independent estimates for incompletely enumerated Indian reserves in 1991, 1996, 2001, 2006, 2011 and 2016;
- adjustment for early enumeration in 1991 and 1996 in parts of Northern Quebec, Newfoundland and Labrador, the Yukon and the Northwest Territories;
- addition of estimates of NPRs in 1971, 1976, 1981 and 1986. Since 1991, NPRs are included in the census universe;
- estimation of the July 1 base population by addition or subtraction of the components of growth between Census Day and June 30.

Adjustment for the census net undercoverage (CNU)

The adjustment for CNU is important. CNU is the difference between the number of persons who should have been enumerated but were missed (undercoverage) and the number of persons who were enumerated but should not have been or who were counted more than once (overcoverage).

Coverage studies provide undercoverage estimates for the 1991, 1996 (www.statcan.gc.ca/c1996-r1996/tech-eng.htm), 2001 (www12.statcan.ca/english/census01/Products/Reference/tech_rep/coverage/index.cfm), 2006, (www12.statcan.gc.ca/census-recensement/2006/ref/rp-guides/rp/coverage-couverture/cov-couv_index-eng.cfm) 2011 (www12.statcan.gc.ca/census-recensement/2011/ref/guides/98-303-x/index-eng.cfm) and 2016 censuses at the provincial and territorial levels, and for the 1971, 1976, 1981 and 1986 censuses at the provincial level only. Estimates of overcoverage at the provincial and territorial levels are available only for the last six censuses (1991 to 2016). Overcoverage for previous censuses was estimated by assuming that the overcoverage-to-undercoverage ratio for each census between 1971 and 1986 was the same as in 1991. The CNU for the Yukon and the Northwest Territories prior to 1991 was estimated by assuming that the ratio between the CNU for each territory and the 10 provinces for each census between 1971 and 1986 was the same as in 1991.

For consistency, the 1991 Census undercoverage and overcoverage were revised in 1998 to take into account the methodological improvements made in the 1996 Census coverage studies. This revision altered CNU in all censuses between 1971 and 1986. Similarly, the 1996 Census undercoverage and overcoverage were revised in 2003.

B. Births and deaths

The numbers of births and deaths are derived directly from the vital statistics database of Statistics Canada's Health Statistics Division. Although Statistics Canada manages the National system of vital statistics, the central vital statistics registries of the provinces and territories are responsible for collecting and processing the information from those administrative files. Under provincial / territorial vital statistics statutes (or similar legislation), all live births and all deaths must be registered, and all provinces and territories provide this information to Statistics Canada.

The vital statistics universe applied to the population estimates includes births and deaths occurring in Canada, in which the usual place of residence of either the birth mother or the deceased is Canada. Any death or birth occurring outside of Canada, even if the mother or the deceased is Canadian, is excluded from the vital statistics population.

Vital statistics by province or territory of residence are used to produce our final estimates of births and deaths. However, before 2011, the final estimates may differ from the data released by the Health Statistics Division due to the imputation of certain unknown values. In addition, for estimates of deaths, the age represents age at the beginning of the period (July 1st) and not the age at the time of occurrence, as with the Health Statistics Division data.

When there are no vital statistics, the number of births is estimated using fertility rates by the mother's age group. The number of deaths is estimated by using mortality rates by age group and sex. These methods are used to calculate preliminary[2] estimates.

Special treatment for preliminary[2] estimates for Quebec and British Columbia

Quebec and British Columbia provide their most recent estimates of births and deaths. The figures are used to produce preliminary[2] estimates. For the final estimates, the two provinces' births and deaths are derived from the vital statistics compiled by Health Statistics Division.

Levels of estimates

For information on the differences between preliminary[2] and final estimates, see sections **B. Births and Deaths**, above.

C. Immigration

Like the numbers of births and deaths, Canadian immigration statistics must be kept by law. In Canada, immigration is regulated by the Immigration and Refugee Protection Act (IRPA) of 2002. This statute superseded the Immigration Act, which was passed in 1976 and amended more than 30 times in the years thereafter. Immigration, Refugees and Citizenship Canada (IRCC) collects and processes immigrants' administrative files. It then provides Statistics Canada with information from Global Case Management System (GCMS) files (until December 2010, data come from the Field Operational Support System files (FOSS)). The information is used to estimate the number and characteristics of people granted permanent resident status by the federal government on a given date. For Demography Division, the terms immigrant and permanent resident are equivalent.

An immigrant is a person who is not a Canadian citizen by birth, but has been granted the right to live in Canada permanently by Canadian immigration authorities. The number of immigrants does not include persons born abroad to Canadian parents who are only temporarily outside the country.

Immigrants are usually counted on or after the date on which they are granted permanent resident status or the right to live in Canada.

Levels of estimates

The difference between preliminary[2] and final postcensal estimates lies in the timeliness of the source used to estimate this component. Since the GCMS files are continually being updated, new calculations are carried out each year to update the immigration estimates. Immigration estimates are preliminary the first year and final the second year.

D. Net non-permanent residents

Like the numbers of births and deaths, Canadian immigration statistics must be kept by law. In Canada, the non-permanent residents (NPR) are regulated by the *Immigration and Refugee Protection Act* (IRPA) of 2002. This statute superseded the *Immigration Act*, which was passed in 1976 and amended more than 30 times in the years thereafter. Immigration, Refugees and Citizenship Canada (IRCC) collects and processes the administrative files of immigrants and NPRs in Canada. It then provides Statistics Canada with information from Global Case Management System (GCMS) files (until June 2011, data come from the Field Operational Support System files (FOSS)). The information is used to estimate the number and characteristics of people granted non-permanent resident status by the federal government.

NPRs are persons who are lawfully in Canada on a temporary basis under the authority of a temporary resident permit, along with members of their family living with them. NPRs include foreign workers, foreign students, the humanitarian population and other temporary residents. The humanitarian population includes refugee claimants

and temporary residents who are allowed to remain in Canada on humanitarian grounds and are not categorized as either foreign workers or foreign students. For Demography Division, the terms non-permanent resident and temporary resident are equivalent.

The number of people in IRCC's administrative system is estimated on a specific date in each period of observation. First, the end-of-period number of NPR is estimated, and then the start-of-period number of NPR is subtracted from that estimate. That yields the net NPRs used in the calculation of the population estimates.

Anyone who received non-permanent resident status prior to the observation date is counted. For refugee claimants, the date of their application is used. Permit holders and refugee claimants are excluded from the population if their permit has expired, if they receive permanent resident status, or if they are deported. In addition, refugee claimants are excluded if their file has been inactive for two years.

Since GCMS files are continually being updated, the figures are recalculated each year until the estimates of net NPR are final.

Levels of estimates

The difference between preliminary[2] and final estimates lies in the timeliness of the source used to estimate this component. Since the GCMS files are continually being updated, the figures are recalculated each year to update the estimates of the net number of NPRs. Non-permanent resident (NPR) estimates are preliminary the first year and updated the following year. They become final two to three years after the reference year, when all other components are also final.

E. Emigration

The number of emigrants is estimated using data from the Office of Immigration Statistics, U.S. Department of Homeland Security, data collected by the Canada child benefit (CCB) program and data from the T1 Family File (T1FF).[4] The first source is used to estimate emigration to the United States. CCB data are used to estimate emigration to other countries. The estimates of the number of child emigrants have to be adjusted because the CCB is not universal and does not provide direct information on the number of adult emigrants. As a result, four adjustment factors are taken into account:

- incomplete coverage due to a delay in the receipt and processing of the files of children eligible for the CCB. Since it seems to take four years after the reference period for CCB administrative files to become complete, the adjustment is made when the estimates are used before this date. The factor is derived from the two-year ratios of emigrant children based on two versions of the CCB files;
- the program's partial coverage, that is, people who do not apply for the CCB or who are not eligible. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCB files;
- the differential propensity to emigrate between children who are eligible for the CCB and children who are not. This factor is obtained by comparing the emigration rates of CCB-eligible children with the rates for all children (aged 0 to 17). This factor is calculated for each province and territory and is based on the last three available years of T1FF;[4]
- the differential propensity to emigrate between adults and children. This factor generates the emigration rate for the population aged 18 and over. It is obtained by (1) calculating the average ratio over three years of the adult and child emigration rates based on T1FF[4] data, (2) calculating the average ratio over three years of the adult and child emigration rates based on data from the Office of Immigration Statistics, U.S. Department of Homeland Security, and (3) taking the average of the two rates. This factor is calculated for Canada only.

The adult emigration rate is applied to the adult population. Adult emigration is distributed by province and territory using data from the T1FF[4] file. We calculate a ratio of the number of emigrant adults to the number of emigrant children from the T1FF[4] file. We then apply this ratio to the number of emigrant children from the CCB by province, which yields the number of adult emigrants whose provincial distribution will differ from that of the children.

The number of adult emigrants combined with the number of child emigrants (once adjusted for the coverage and differential emigration factors) generate the number of emigrants for the entire population.

Emigration is disaggregated by province and territory based on the number of child emigrants adjusted for coverage and differential emigration.

Please note that the estimates for the most recent periods are expected to be very similar. In the absence of more up-to-date data sources, the emigration rate of the last available year is applied to the beginning of the year population estimate to be estimated.

Levels of estimates

For information on the differences between preliminary[2] and final estimates, see sections **E. Emigration**, above.

F. Net temporary emigration

Some people leave Canada to live temporarily in another country while others who were temporarily outside of Canada return. The net result of those departures and returns is the component known as "net temporary emigration". Estimates of the number of departures are derived from the Reverse Record Check (RRC), the most important census coverage study. The RRC provides an estimate of the number of people who left Canada temporarily during an intercensal period and are still out of the country at the end of the period. Estimates of the number of returns are based on two sources: the census and Demography Division's estimates of returning emigrants. The census provides the number of people who were outside Canada at the time of the previous census and returned during the intercensal period. That number includes all returning emigrants. Then Demography Division's estimate of the returning emigrants component is subtracted to produce the number of returning temporary emigrants. The estimated numbers of departures (RRC) and returns (census and Demography Division) yield an estimate of net temporary emigration.

Net temporary emigration is calculated first for the national level. It is then disaggregated by province or group of provinces based on RRC estimates of temporary emigration. For the Atlantic provinces and the territories, the estimate for the group is disaggregated on the basis of each province / territory's proportion of the group's total population.

This estimate is for the whole intercensal period; it is disaggregated into estimates for each of the five years in the period and then into monthly estimates using a seasonal adjustment that is an average between zero seasonality and the seasonality of emigration.

Net temporary emigration can be estimated only for the intercensal period preceding the most recent census. For the current period, the rate of the last available year is applied to the beginning of the year population estimate to be estimated.

Levels of estimates

The difference between preliminary[2] and final estimates lies in the timeliness of the emigration estimate used to calculate the seasonal adjustment for the net temporary emigration. The same estimation method is used.

G. Returning emigrants

A returning emigrant is a person who returns to Canada after having been classified as an emigrant. In a manner similar to the procedure used to calculate the number of emigrants, data from the Canada child benefit (CCB) file from Canada Revenue Agency (CRA) and T1FF[4] file are used to estimate the number of returning emigrants. Adjustment factors are applied to compensate for the fact that the CCB program is not universal, and an adult/child ratio is used to estimate the number of adult returning emigrants. As a result, four adjustment factors are used to take into account:

- incomplete coverage due to a delay in the receipt and processing of the files of children eligible for the CCB. Since it seems to take four years after the reference period for CCB administrative files to become complete, the adjustment is made when the estimates are used before this date. The factor is derived from the two-year ratios of returning emigrant children based on two versions of the CCB files;
- the program's partial coverage, that is, people who do not apply for the CCB or who are not eligible. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCB files;

- the differential propensity to emigrate between children who are eligible for the CCB and children who are not. This factor is obtained by comparing the emigration rates of CCB-eligible children with the rates for all children (aged 0 to 17). This factor is calculated for each province and territory and is based on the last three available years of T1FFs;[4]
- the adult/child ratio, which is based on the 2011 National Household Survey.

Please note that the estimates for the most recent periods are expected to be identical or very similar. In the absence of more up-to-date data sources, the assumption is made that levels remain similar.

Levels of estimates

For information on the differences between preliminary[2] and final estimates, see sections **G. Returning emigrants**, above.

H. Interprovincial migration

Interprovincial migration represents movements from one province or territory to another, involving a change in usual place of residence. As is the case for emigration, there is no provision for recording interprovincial migration in Canada. Consequently, such movements have to be estimated using data from the Canada child benefit (CCB) of Canada Revenue Agency (CRA) and T1FF.[4]

Final estimates of interprovincial migration are obtained by comparing addresses indicated on personal income tax returns over two consecutive tax years. However, the migration status of tax filers' dependants has to be imputed. An adjustment is also required to take into account migrants who do not file income tax returns. From 2001/2002 to 2005/2006, the adjustment was slightly modified (for further information, see Wilkinson, 2004) (www.statcan.gc.ca/pub/91f0015m/91f0015m2004006-eng.pdf). From 2006/2007, this adjustment has been slightly modified (Cyr, 2008 – Internal document).

Since income tax returns are not available at the time preliminary[2] estimates are produced, the estimation of preliminary[2] interprovincial migration is based on CCB administrative files, which provide counts of child migrants (aged 0 to 17) registered to the program. The estimates have to be adjusted later for children who are not registered to the CCB program. Finally, the number of adult migrants is calculated using the number of child migrants and factors derived from the T1FF.[4] As a result, three adjustment factors are used to take into account:

- the program's partial coverage, that is, people who are not registered to the CCB program. This factor is obtained by comparing the estimated number of children in the population with the number of children in CCB files;
- the differential propensity to migrate between children who are registered to the CCB program and children who are not. This factor is obtained by comparing the out-migration rates of children registered to the CCB program with the rates for all children (aged 0 to 17). This factor is calculated for each province and territory and is based on the last available year of T1FF;[4]
- the differential propensity to migrate between adults and children. This factor generates the out-migration rate of the population aged 18 and over for each province / territory of origin and destination. It is obtained by calculating the ratio of the central migration rate for adults to the rate for children. It is estimated using data from the last three available years of T1FF.[4]

The adult migration rate is then applied to the estimated adult population. The number of adult migrants is then added to the number of child migrants to produce the number of interprovincial migrants for the entire population.

Since 2015, the method to estimate the interprovincial migration has been modified. This new method is applied from July 2011 onward. In order to reduce the differences between the preliminary annual series (which was derived from the sum of 12 monthly migration matrices) and the final annual series, CCB microdata have been used. Using microdata is allowing estimating migration for various periods (monthly, quarterly and annually). It also allows improving the comparability between preliminary[2] and final estimates. Final annual estimates (T1FF)[4] are now distributed by quarter on the basis of preliminary[2] quarterly estimates derived from CCB microdata. It is important to note that, as a result of using CCB microdata, it is not possible to add the quarterly interprovincial in-migrants and out-migrants estimates to get the annual estimates. It is however possible to add the quarterly net interprovincial migration estimates to get the annual estimates.

Levels of estimates

For information on the differences between preliminary[2] and final estimates of total interprovincial migration, see section **H. Interprovincial migration** above.

Intercensal population estimates

Intercensal estimates – population estimates for reference dates between two censuses – are produced following each census. They reconcile previous postcensal estimates with the new census counts adjusted for the CNU.[1]

There are two main steps in the production of intercensal estimates:

- calculation of the error of closure;
- linear distribution of the error of closure.

The error of closure is defined as the difference between the postcensal population estimates on Census Day and the population enumerated in that census adjusted for CNU.[1]

The error of closure is spread uniformly over the intercensal period of days within each month.

Quality of demographic data

The estimates contain certain inaccuracies stemming from two types of errors:

- errors in the census data;
- imperfections in other data sources and the method used to estimate the components.

Census data

A. Coverage, response and imputation errors

The errors attributable to census data can be divided into two groups: response and processing errors, and coverage errors. The first group implies non-response error, misinterpretation by respondents, incorrect coding and non-response imputation. Errors in the second group primarily result from undercoverage and, to a lesser extent, overcoverage. It should be noted that both types of errors are intrinsic to any survey data.

The coverage errors occur when dwellings and/or individuals are missed, incorrectly included (except for the 2006, 2011 and 2016 censuses, where people incorrectly included were not considered in the Census Overcoverage Study) or counted more than once. Following each census, Statistics Canada undertakes coverage studies to measure these errors. The main studies are the Reverse Record Check Survey (RRC) and the Census Overcoverage Study (COS). Based on these studies, estimates of census undercoverage and overcoverage are produced. Demography Division adjusts the population enumerated in the census by province and territory using these estimates.

When creating base populations, the Demographic Estimates Program (DEP) corrects the census populations only for coverage errors. This correction, which is based on the findings of coverage studies, is primarily subject to sampling errors, and to a lesser extent, processing errors. Statistical tests indicate that coverage adjustments improve the quality of census data. The DEP uses the estimates from coverage studies for the provinces and territories. However, given the size of the samples in these studies, estimates by age and sex are modelled. Furthermore, it is assumed that the coverage rates estimated for a province or territory apply to the regions within that geographic area. Prior to 1993[5], the DEP used census data that was unadjusted for coverage errors. Coverage studies had been done to measure undercoverage, but none measured overcoverage. Following the decision to integrate a correction for the coverage to the enumerated population in 1991, the DEP had to revise the population estimates for the period from 1971 to 1992. The correction is based on the findings of the coverage studies conducted during this period and on hypotheses regarding the ratio between the overcoverage and undercoverage levels based on the findings of subsequent coverage studies.

The corrections to the census data due to CNU improved, in general, the quality of the estimates by compensating for the differential undercoverage by age, sex and by province/territory across censuses.

Table D1
Estimated census net undercoverage, Canada, provinces and territories, 2001 to 2016 censuses

Geography	Census population	Census net undercoverage	Incompletely enumerated Indian reserves	Adjusted population	Rate
	A	B	C	D=A+B+C	(B+C)/D*100
	number				percent
2016[1]					
Canada	**35,151,728**	**849,727**	**27,790**	**36,029,245**	**2.44**
Newfoundland and Labrador	519,716	9,774	0	529,490	1.85
Prince Edward Island	142,907	3,464	0	146,371	2.37
Nova Scotia	923,598	17,809	0	941,407	1.89
New Brunswick	747,101	15,735	0	762,836	2.06
Quebec	8,164,361	35,191	11,985	8,211,537	0.57
Ontario	13,448,494	381,542	11,640	13,841,676	2.84
Manitoba	1,278,365	31,895	0	1,310,260	2.43
Saskatchewan	1,098,352	34,844	0	1,133,196	3.07
Alberta	4,067,175	115,968	4,043	4,187,186	2.87
British Columbia	4,648,055	197,267	122	4,845,444	4.07
Yukon	35,874	2,370	0	38,244	6.20
Northwest Territories	41,786	2,939	0	44,725	6.57
Nunavut	35,944	929	0	36,873	2.52
2011[1]					
Canada	**33,476,688**	**759,125**	**37,392**	**34,273,205**	**2.32**
Newfoundland and Labrador	514,536	10,192	0	524,728	1.94
Prince Edward Island	140,204	3,386	0	143,590	2.36
Nova Scotia	921,727	21,911	0	943,638	2.32
New Brunswick	751,171	3,930	0	755,101	0.52
Quebec	7,903,001	73,240	16,882	7,993,123	1.13
Ontario	12,851,821	369,874	14,926	13,236,621	2.91
Manitoba	1,208,268	21,698	608	1,230,574	1.81
Saskatchewan	1,033,381	29,580	768	1,063,729	2.85
Alberta	3,645,257	128,584	4,094	3,777,935	3.51
British Columbia	4,400,057	91,280	114	4,491,451	2.03
Yukon	33,897	1,356	0	35,253	3.85
Northwest Territories	41,462	1,977	0	43,439	4.55
Nunavut	31,906	2,117	0	34,023	6.22
2006[1]					
Canada	**31,612,897**	**868,658**	**40,115**	**32,521,670**	**2.79**
Newfoundland and Labrador	505,469	5,046	0	510,515	0.99
Prince Edward Island	135,851	1,903	0	137,754	1.38
Nova Scotia	913,462	24,558	0	938,020	2.62
New Brunswick	729,997	16,059	0	746,056	2.15
Quebec	7,546,131	60,751	16,600	7,623,482	1.01
Ontario	12,160,282	465,824	15,391	12,641,497	3.81
Manitoba	1,148,401	34,330	0	1,182,731	2.90
Saskatchewan	968,157	22,594	739	991,490	2.35
Alberta	3,290,350	111,353	7,272	3,408,975	3.48
British Columbia	4,113,487	121,551	113	4,235,151	2.87
Yukon	30,372	1,805	0	32,177	5.61
Northwest Territories	41,464	1,620	0	43,084	3.76
Nunavut	29,474	1,264	0	30,738	4.11

Table D1
Estimated census net undercoverage, Canada, provinces and territories, 2001 to 2016 censuses

Geography	Census population	Census net undercoverage	Incompletely enumerated Indian reserves	Adjusted population	Rate
	A	B	C	D=A+B+C	(B+C)/D*100
	number				percent
2001[1]					
Canada	**30,007,094**	**924,430**	**34,539**	**30,966,063**	**3.10**
Newfoundland and Labrador	512,930	9,401	0	522,331	1.80
Prince Edward Island	135,294	1,325	0	136,619	0.97
Nova Scotia	908,007	24,521	0	932,528	2.63
New Brunswick	729,498	20,095	0	749,593	2.68
Quebec	7,237,479	140,232	12,648	7,390,359	2.07
Ontario	11,410,046	436,349	15,960	11,862,355	3.81
Manitoba	1,119,583	30,903	110	1,150,596	2.70
Saskatchewan	978,933	21,231	581	1,000,745	2.18
Alberta	2,974,807	69,857	4,977	3,049,641	2.45
British Columbia	3,907,738	164,542	263	4,072,543	4.05
Yukon	28,674	1,423	0	30,097	4.73
Northwest Territories	37,360	3,295	0	40,655	8.10
Nunavut	26,745	1,256	0	28,001	4.49

1. The levels and rates are based on the Reverse Record Check (RRC) and the Overcoverage Study and include non-permanent residents.

Source: Statistics Canada, Demography Division.

The adjustment also incorporates the results of a study on the estimates of the number of people living on incompletely enumerated Indian reserves to complete the corrections for coverage errors in the census. The results of the coverage studies contain mainly sampling errors.

These adjustments have a direct impact on:

- the error of closure and its distribution by age and sex within a province or a territory as well as by province/territory as the CNU[1] and its distribution vary from one census to another;
- within-cohort consistency of population estimates. If for example, the male cohort of children in age group 0 to 4 in 1981 was tracked up to the 2001 Census (unadjusted for CNU)[1] the age group 20 to 24 would be noticeably smaller in 2001 than the age group 15 to 19 in 1996. Since Canada receives many immigrants within these age groups, the opposite would be expected. However, only after adjustment for CNU,[1] the cohort size increases from 1996 to 2001.

For further information regarding the main coverage studies, please see the following document on Statistics Canada's web site: 1996 (www.statcan.gc.ca/c1996-r1996/tech-eng.htm), 2001 (www12.statcan.ca/english/census01/Products/Reference/tech_rep/coverage/index.cfm), 2006 (www12.statcan.gc.ca/census-recensement/2006/ref/rp-guides/rp/coverage-couverture/cov-couv_index-eng.cfm) and 2011 (www12.statcan.gc.ca/census-recensement/2011/ref/guides/98-303-x/index-eng.cfm) Census Technical Report on Coverage. The 2016 Census report will be available in 2019.

Components

Errors due to estimation methodologies and data sources other than the census can also be significant.

A. Births and deaths

Since the law requires the recording of vital statistics, the final estimates for births and deaths data meet very high standards. Nevertheless, since preliminary[2] estimates are derived, they can be slightly different from final estimates.

B. Immigration and non-permanent residents

With respect to immigrants and non-permanent residents, Immigration, Refugees and Citizenship Canada (IRCC) administers special data files on both of these components. Since immigration is controlled by law, data on immigrants and NPRs are compiled upon arrival in Canada. These data represent only "legal" immigration and exclude illegal immigrants. Thus, for the "legal" part of international movement into Canada, the data are considered to be of high quality. However, some biases such as the difference between the stated province of intended residence at the time of arrival and the actual province of residence, may persist. Finally, since information provided by the Visitor Data System (VDS) from IRCC is not complete (age and sex of dependents, province of residence for certain groups of permit holders), estimates of NPRs are more prone to error than data on immigrants.

C. Emigration, returning emigration and net temporary emigration

Of all the demographic components that are used by the DEP, the emigration, returning emigration and net temporary emigration are the most difficult to estimate with precision. Canada does not have a complete border registration system. While immigration and non-permanent residents (NPRs) are well documented by the federal government, Statistics Canada has always used indirect techniques for the estimation of the number of persons leaving the country. For this reason, available statistics regarding these three components have historically been of a lower quality than other components.

Estimates of the number of emigrants and returning emigrants are both derived using Canada child benefit (CCB) data provided by Canada Revenue Agency (CRA). Estimates must be adjusted to take into account the incomplete coverage of the program and to derive the emigration and returning emigration of adults.

These adjustments and the delay in obtaining the data are the two main sources of errors. As current information on the number of persons living temporarily abroad does not exist, estimates are based on the Reverse Record Check (RRC) and the census. Estimates for the intercensal period are distributed equally among the five years. Moreover, assumptions were made to allow for the distribution of national estimates by province and territory and of annual estimates to a quarterly level. Assumptions must also be made to establish the variation for the postcensal period. Any geographical or quarterly variation may introduce error in the estimation of these components.

D. Interprovincial migration

Since July 1993, preliminary[2] interprovincial migration estimates have been based on Canada child benefit (CCB) files. As this program covers only children, various adjustments must be done in order to derive the migration of adults. Consequently, preliminary[2] CCB based estimates are subject to larger error than final estimates derived from Canada Revenue Agency (CRA) tax files.

Quality assessment

In order to assess the quality of our estimates, two evaluation measures are used: precocity errors and errors of closure.

A. Precocity error

The quality of preliminary estimates of components is analyzed using precocity errors. Precocity error is defined as the difference between preliminary and final estimate in terms of its relative proportion of the total population most up to date postcensal population estimate. It can be calculated for both population and component estimates.

The precocity error allows for useful comparisons between components, as well as between provinces and territories of different population size. Note that when compared to the total population for an area, the differences between preliminary and final estimates of the components are quite small. There are, however, differences in the amount of impact on the population estimates between components and between provinces and territories.

Generally speaking, net interprovincial migration yields the greatest precocity errors. This is the result of the use of different data sources for preliminary and final estimates. In most years and for most provinces/territories, births, deaths and immigration estimates yield the smallest precocity errors. For immigration estimates, this

reflects the completeness of the data source and the availability of data for the more timely preliminary estimates. In the case of births and deaths, small precocity errors can be explained by the use of a different method (method of ratios) for preliminary estimates.

According to the analysis of the most recent precocity errors and assuming that the quality of the basic data remains constant, the present postcensal estimates should have an acceptable degree of reliability.

For more information on annual precocity error analysis, see publication 91-215-XWE 2018001 (Quality of demographic data section, http://www.statcan.gc.ca/pub/91-215-x/2018001/dq-qd-eng.htm).

Table D2
Quarterly precocity errors for components, Canada, provinces and territories

Year/Component	Canada	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	per thousand													
Births														
2016Q01	0.03	0.09	-0.05	-0.01	0.03	-0.03	0.04	-0.07	0.02	0.19	0.00	-0.53	0.43	0.76
2016Q02	0.07	-0.10	-0.12	0.08	0.04	0.01	0.13	0.21	0.16	0.07	-0.03	-0.37	-0.43	-0.08
2016Q03	0.07	-0.26	-0.42	0.12	-0.04	-0.02	0.12	0.17	0.17	0.17	-0.01	0.62	0.31	-0.08
2016Q04	0.13	0.02	0.07	0.10	0.00	0.02	0.22	0.07	0.15	0.24	-0.01	-0.21	0.58	-0.54
Deaths														
2016Q01	0.08	0.16	0.58	0.22	0.14	-0.05	0.17	0.10	0.13	0.05	-0.02	-0.08	-0.29	-0.38
2016Q02	0.04	0.05	0.48	0.07	-0.05	-0.02	0.08	0.09	0.02	0.07	-0.02	0.29	-0.16	-0.16
2016Q03	0.04	-0.02	0.12	0.00	-0.11	-0.03	0.09	0.03	0.13	0.05	-0.01	0.00	0.11	-0.05
2016Q04	0.05	0.03	0.23	0.02	0.02	-0.02	0.12	-0.04	0.09	0.03	-0.01	-0.18	0.13	0.13
Immigration														
2017Q01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017Q02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017Q03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017Q04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emigration														
2015Q03	-0.10	0.09	0.18	-0.05	-0.12	-0.10	-0.14	-0.07	-0.19	-0.04	-0.09	-0.13	0.18	-0.03
2015Q04	-0.07	0.06	0.06	0.05	-0.04	-0.06	-0.08	0.01	-0.06	-0.11	-0.08	-0.05	0.05	0.00
2016Q01	-0.04	0.05	0.05	0.00	-0.05	-0.03	-0.06	-0.07	-0.09	-0.10	0.07	0.00	0.09	-0.03
2016Q02	0.03	-0.02	-0.02	0.03	0.02	0.05	0.04	-0.04	-0.02	-0.04	0.04	-0.24	-0.02	0.03
Returning emigration														
2015Q03	-0.05	0.05	0.16	-0.02	-0.02	-0.02	-0.06	0.10	-0.07	-0.05	-0.15	-0.05	0.11	0.00
2015Q04	0.00	0.02	0.07	0.00	0.00	0.00	0.00	0.05	-0.02	0.00	-0.04	0.00	0.07	0.00
2016Q01	-0.02	0.02	0.05	-0.01	-0.01	0.00	-0.02	0.04	-0.02	-0.01	-0.05	0.00	0.07	0.00
2016Q02	-0.03	0.02	0.07	-0.01	0.00	-0.02	-0.04	0.02	-0.02	0.01	-0.06	0.08	0.07	0.00
Net temporary emigration														
2015Q03	-0.07	-0.01	0.00	-0.01	-0.01	-0.09	-0.14	0.01	-0.08	0.00	0.02	-0.08	-0.09	-0.05
2015Q04	-0.06	-0.01	-0.01	-0.01	-0.01	-0.07	-0.11	0.01	-0.06	0.00	0.02	-0.05	-0.05	-0.05
2016Q01	-0.05	-0.01	-0.01	0.00	-0.01	-0.07	-0.11	0.01	-0.06	0.00	0.03	-0.08	-0.02	-0.08
2016Q02	-0.05	0.00	0.00	0.00	0.00	-0.06	-0.10	0.02	-0.05	0.01	0.04	-0.05	-0.02	-0.05
Net non-permanent residents														
2015Q03	0.14	0.16	0.31	0.35	0.19	0.08	0.16	0.12	0.15	0.11	0.15	0.05	0.25	0.03
2015Q04	0.05	0.06	0.09	0.10	0.06	0.05	0.08	0.13	0.08	0.06	-0.08	0.11	0.02	-0.03
2016Q01	0.04	0.00	0.01	0.04	0.04	0.04	0.06	0.04	-0.02	0.06	-0.05	-0.11	-0.04	-0.05
2016Q02	-0.01	0.09	-0.12	0.10	0.05	-0.02	0.01	0.06	0.03	0.03	-0.16	-0.03	-0.11	0.00
In-migrants														
2016Q03	0.23	0.07	-0.05	0.22	0.51	0.12	0.28	0.02	0.34	0.41	0.09	0.23	0.83	3.08
2016Q04	0.11	0.00	0.01	0.09	0.19	0.05	0.12	-0.03	0.22	0.21	0.06	0.93	0.61	1.70
2017Q01	0.17	0.10	0.04	0.13	0.36	0.08	0.18	0.01	0.35	0.35	0.08	-1.11	2.11	4.57
2017Q02	0.26	0.29	0.40	0.11	0.47	0.11	0.29	0.01	0.65	0.46	0.19	-0.59	1.12	6.30
Out-migrants														
2016Q03	0.23	0.59	2.38	0.91	1.15	0.20	0.00	0.35	0.59	0.24	0.33	3.40	5.06	2.62
2016Q04	0.11	0.29	0.76	0.40	0.56	0.09	0.00	0.17	0.34	0.14	0.15	1.86	1.53	1.65
2017Q01	0.17	0.56	1.98	0.68	0.88	0.10	0.00	0.25	0.49	0.18	0.24	4.38	5.13	2.96
2017Q02	0.26	0.66	2.54	0.90	0.92	0.21	0.01	0.41	0.56	0.43	0.40	5.54	4.55	3.30
Net interprovincial migration														
2016Q03	...	-0.51	-2.43	-0.69	-0.64	-0.08	0.28	-0.33	-0.25	0.17	-0.24	-3.16	-4.23	0.46
2016Q04	...	-0.29	-0.74	-0.31	-0.38	-0.03	0.12	-0.20	-0.12	0.07	-0.09	-0.93	-0.92	0.05
2017Q01	...	-0.46	-1.94	-0.55	-0.52	-0.02	0.18	-0.24	-0.14	0.16	-0.16	-5.49	-3.03	1.61
2017Q02	...	-0.37	-2.15	-0.78	-0.45	-0.10	0.29	-0.40	0.09	0.03	-0.21	-6.13	-3.44	3.00

... not applicable

Source: Statistics Canada, Demography Division.

B. Error of closure

The error of closure measures the accuracy of the final postcensal estimates. It is defined as the difference between the final postcensal population estimates on Census Day and the enumerated population of the most recent census adjusted for census net undercoverage (CNU[1]). A positive error of closure means that the postcensal population estimates have overestimated the population.

The error of closure comes from three sources: errors primarily due to sampling when measuring the starting (2011) and end of period (2016) censuses coverage and errors related to the components of population growth over the intercensal period. For each five-year intercensal period, the error of closure can only be calculated following the release of census data and estimates of CNU.[1] The error of closure can be calculated for the total population of each province and territory as well as by age and sex. For the moment, the error is only available for total population by province and territory.

Table D3 shows postcensal population estimates on May 10, 2016 and census counts adjusted for CNU[1] and the errors of closure for Canada, provinces and territories from 2001 to 2016.

For Canada as a whole, the error of closure was estimated at 110,310 or 0.31% in 2016. This is a decrease over the error for 2011 (0.42%).

The population estimates overestimated the population of eight provinces, one territory and Canada as a whole. Five provinces posted errors of closure greater than 1% or less than -1%. Of these jurisdictions, only British Columbia's estimated population differed from the adjusted census population by more than 2% (-2.07%). In 2011, four provinces and two territories posted errors of closure greater than 1% or less than -1%.

By considering the variance in CNU, it is possible to identify errors of closure that are statistically significant. Table D3 shows the results of this analysis.

The error of closure is statistically significant for Canada and seven provinces. This means that the population estimates significantly overestimated or underestimated the adjusted census population in these jurisdictions. As noted above, these results are due to both the sampling for census coverage studies and errors in the components of population growth over the intercensal period. Among these components, interprovincial migration and emigration are mostly associated with large errors of closure.

Table D3
Error of closure of the population estimates, Canada, provinces and territories, 2001 to 2016

Geography	Postcensal estimate on Census Day	Census adjusted for CNU[1]	Error of closure		CNU standard error[2]	t value[3]
	A	B	C=A-B	D=C/B*100	E	F=C/E
	number			%	number	
2016						
Canada	**36,139,555**	**36,029,245**	**110,310**	**0.31**	**43,844**	**2.52**
Newfoundland and Labrador	530,465	529,490	975	0.18	2,015	0.48
Prince Edward Island	149,116	146,371	2,745	1.88	870	3.16
Nova Scotia	948,080	941,407	6,673	0.71	3,042	2.19
New Brunswick	756,736	762,836	-6,100	-0.80	2,777	-2.20
Quebec	8,297,802	8,211,537	86,265	1.05	20,613	4.18
Ontario	13,902,359	13,841,676	60,683	0.44	33,316	1.82
Manitoba	1,313,904	1,310,260	3,644	0.28	4,829	0.75
Saskatchewan	1,145,156	1,133,196	11,960	1.06	4,651	2.57
Alberta	4,231,285	4,187,186	44,099	1.05	13,530	3.26
British Columbia	4,745,041	4,845,444	-100,403	-2.07	16,561	-6.06
Yukon	37,927	38,244	-317	-0.83	191	-1.66
Northwest Territories	44,667	44,725	-58	-0.13	257	-0.23
Nunavut	37,017	36,873	144	0.39	229	0.63
2011						
Canada	**34,417,759**	**34,273,205**	**144,554**	**0.42**	**57,546**	**2.51**
Newfoundland and Labrador	513,622	524,728	-11,106	-2.12	2,912	-3.81
Prince Edward Island	145,759	143,590	2,169	1.51	923	2.35
Nova Scotia	948,457	943,638	4,819	0.51	5,346	0.90
New Brunswick	756,547	755,101	1,446	0.19	3,335	0.43
Quebec	7,968,651	7,993,123	-24,472	-0.31	23,660	-1.03
Ontario	13,345,467	13,236,621	108,846	0.82	44,121	2.47
Manitoba	1,251,999	1,230,574	21,425	1.74	6,104	3.51
Saskatchewan	1,055,858	1,063,729	-7,871	-0.74	6,306	-1.25
Alberta	3,774,557	3,777,935	-3,378	-0.09	18,046	-0.19
British Columbia	4,543,807	4,491,451	52,356	1.17	19,494	2.69
Yukon	35,356	35,253	103	0.29	303	0.34
Northwest Territories	44,139	43,439	700	1.61	323	2.17
Nunavut	33,540	34,023	-483	-1.42	608	-0.79
2006						
Canada	**32,553,799**	**32,521,670**	**32,129**	**0.10**	**53,926**	**0.60**
Newfoundland and Labrador	508,874	510,515	-1,641	-0.32	2,710	-0.61
Prince Edward Island	137,746	137,754	-8	-0.01	701	-0.01
Nova Scotia	933,692	938,020	-4,328	-0.46	4,885	-0.89
New Brunswick	748,737	746,056	2,681	0.36	3,105	0.86
Quebec	7,644,701	7,623,482	21,219	0.28	24,077	0.88
Ontario	12,657,808	12,641,497	16,311	0.13	41,363	0.39
Manitoba	1,176,744	1,182,731	-5,987	-0.51	6,469	-0.93
Saskatchewan	987,706	991,490	-3,784	-0.38	4,805	-0.79
Alberta	3,357,637	3,408,975	-51,338	-1.51	16,091	-3.19
British Columbia	4,296,518	4,235,151	61,367	1.45	16,591	3.70
Yukon	31,146	32,177	-1,031	-3.20	194	-5.31
Northwest Territories	42,160	43,084	-924	-2.14	236	-3.92
Nunavut	30,330	30,738	-408	-1.33	176	-2.32

Table D3
Error of closure of the population estimates, Canada, provinces and territories, 2001 to 2016

Geography	Postcensal estimate on Census Day	Census adjusted for CNU[1]	Error of closure		CNU standard error[2]	t value[3]
	A	B	C=A-B	D=C/B*100	E	F=C/E
	number			%	number	
2001						
Canada	**31,016,011**	**30,966,063**	**49,948**	**0.16**	**44,749**	**1.12**
Newfoundland and Labrador	533,712	522,331	11,381	2.18	1,782	6.39
Prince Edward Island	138,102	136,619	1,483	1.09	775	1.91
Nova Scotia	941,533	932,528	9,005	0.97	4,170	2.16
New Brunswick	754,180	749,593	4,587	0.61	3,555	1.29
Quebec	7,390,137	7,390,359	-222	0.00	21,033	-0.01
Ontario	11,873,643	11,862,355	11,288	0.10	33,472	0.34
Manitoba	1,149,561	1,150,596	-1,035	-0.09	5,423	-0.19
Saskatchewan	1,016,762	1,000,745	16,017	1.60	4,333	3.70
Alberta	3,051,245	3,049,641	1,604	0.05	11,308	0.14
British Columbia	4,068,196	4,072,543	-4,347	-0.11	15,598	-0.28
Yukon	29,737	30,097	-360	-1.20	372	-0.97
Northwest Territories	41,152	40,655	497	1.22	362	1.37
Nunavut	28,051	28,001	50	0.18	411	0.12

1. Census net undercoverage includes the incompletely enumerated Indian reserves.
2. Census net undercoverage excludes the incompletely enumerated Indian reserves.
3. An error of closure with a t value greater than 1.96 or less than -1.96 is statistically significant at the 95% confidence level.

Source: Statistics Canada, Demography Division.

Explanatory notes for the tables

Table D4
Quarterly population estimates and factors of demographic growth, provincial perspective

Quarter	Population at beginning period	Natural increase	Net interprovincial migration	Net international migration	Total net migration	Residual deviation	Total growth
Q2 2001 to Q2 2016	ID	D	D	D	D	D	D
Q3 2016	PD	D	D	R	R	...	R
Q4 2016	PR	D	D	R	R	...	R
Q1 2017	PR	R	D	R	R	...	R
Q2 2017	PR	R	D	R	R	...	R
Q3 2017	PR	R	R	R	R	...	R
Q4 2017	PR	R	R	R	R	...	R
Q1 2018	PR	R	R	R	R	...	R
Q2 2018	PR	P	P	P	P	...	P
Q3 2018	PP	...	...	...	...	...	...
Modified since[1]	Q3 2001	Q1 2011	Q3 2016	Q3 2001	Q3 2001	Q2 2001	Q2 2001

... not applicable

1. Modified since indicates the quarter from which the data were revised since the last release. Last quarter's data were not modified as they are released for the first time.

Note: D: Final estimates. ID: Final intercensal estimates. PD : Final postcensal estimates. R : Updated estimates. PR : Updated postcensal estimates. P : Preliminary estimates. PP : Preliminary postcensal estimates, Q1 : January to March, Q2 : April to June, Q3 : July to September, Q4 : October to December.
Source: Statistics Canada, Demography Division.

Table D5
Quarterly estimates of components of demographic growth

Quarter	Births	Deaths	In-migrants	Out-migrants	Immigrants	Emigrants	Returning emigrants	Net temporary emigrants	Net non-permanent residents	Residual deviation
Q2 2001 to Q2 2016	D	D	D	D	D	D	D	D	D	D
Q3 2016	D	D	D	D	D	R	R	R	R	...
Q4 2016	D	D	D	D	D	R	R	R	R	...
Q1 2017	R	R	D	D	D	R	R	R	R	...
Q2 2017	R	R	D	D	D	R	R	R	R	...
Q3 2017	R	R	R	R	D	R	R	R	R	...
Q4 2017	R	R	R	R	D	R	R	R	R	...
Q1 2018	R	R	R	R	R	R	R	R	R	...
Q2 2018	P	P	P	P	P	P	P	P	P	...
Modified since[1]	Q1 2014	Q1 2011	Q3 2016	Q3 2016	Q1 2011	Q3 2001	Q3 2001	Q3 2001	Q3 2001	Q2 2001

... not applicable

1. Modified since indicates the quarter from which the data were revised since the last release. Last quarter's data were not modified as they are released for the first time.

Note: D : Final estimates. R : Updated estimates. P : Preliminary estimates. Q1 : January to March, Q2 : April to June, Q3 : July to September, Q4 : October to December.
Source: Statistics Canada, Demography Division.

Endnotes

1. In this case, the adjustment for the census net undercoverage also includes the incompletely enumerated Indian reserves (IEIR).
2. Unless otherwise noted, the term preliminary include both preliminary and updated estimates.
3. From 1991 to 2001 Census, "persons with a usual place of residence in Canada who hold Minister's permits (including extensions) and members of their families living with them" were included in the census universe.
4. The T1 family file (T1FF) is derived from the Canada Revenue Agency (CRA) T1 file by Income Statistics Division of Statistics Canada.
5. In September 1993, the DEP took advantage of the integration of the 1991 Census counts to produce a series of estimates beginning in 1971 and including census net undercoverage.

Appendix 1: Glossary

Census coverage
Census net undercoverage: Difference between undercoverage and overcoverage.

Overcoverage: Number of persons who should not have been counted in the census or who were counted more than once.

Undercoverage: Number of persons who were intended to be enumerated in a census but were not.

Components of demographic growth
Any of the classes of events generating population movement variations. Births, deaths and migrations are the components responsible for the variation since they alter the total population.

Emigrant
Canadian citizen or **immigrant** who has left Canada to establish a residence in another country, involving a change in usual place of residence. Emigration may be either temporary or permanent. Where the term is used alone, it references to a person's permanent emigration which involves severing residential ties with Canada and acquiring permanent residency in another country.

Error of closure
Difference between the **postcensal estimate** at the census date and the results of the census adjusted for **census net undercoverage** (including adjustment for incompletely enumerated Indian reserves).

Immigrant
Within the framework of this publication, the terms immigrant, landed immigrant and permanent resident are equivalent. An immigrant refers to a person who is or has ever been a landed immigrant (permanent resident) and who has been granted the right to live in Canada permanently by immigration authorities. Immigrants are either Canadian citizens by naturalization (the citizenship process) or permanent residents under Canadian legislation. Some immigrants have resided in Canada for a number of years, while others have arrived recently. Most immigrants are born outside Canada, but a small number are born in Canada. Also, children born in other countries to parents who are Canadian citizens that reside temporarily in another country are not included in the category as they become Canadian citizens at birth.

International migration
International migration represents movement of population between Canada and a foreign country which involves a change in the usual place of residence. A distinction is made with regard to **immigrants**, **emigrants**, **returning emigrants**, **net temporary emigration** and **net non-permanent residents**.

Interprovincial migration
Interprovincial migration represents all movements from one province or territory to another involving a change in the usual place of residence. A person who takes up residence in another province or territory is an **out-migrant** with reference to the province or territory of origin and an **in-migrant** with reference to the province or territory of destination.

Natural increase
Variation in the population size over a given period as a result of the difference between the numbers of births and deaths.

Net international migration
Net international migration is obtained according to the following formula:
Immigrants + returning emigrants + net non-permanent residents– (emigrants + net temporary emigrants).

Net interprovincial migration
Net interprovincial migration represents the difference between ***in-migrants*** and ***out-migrants*** for a given province or territory.

Net non-permanent residents
Net non-permanent residents represent the variation in the number of non-permanent residents between two dates.

Non-permanent residents
A non-permanent resident is a person who is lawfully in Canada on a temporary basis under the authority of a valid document (work permit, study permit, Minister's permit or refugee) issued for that person along with members of his family living with them. This group also includes individuals who seek refugee status upon or after their arrival in Canada and remain in the country pending the outcome of processes relative to their claim. Note that Immigration, Refugees and Citizenship Canada (IRCC) uses the term temporary resident rather than non-permanent resident.

Net temporary emigration
Net temporary emigration represents the variation in the number of temporary emigrants between two dates. Temporary emigration includes Canadian citizens and ***immigrants*** living temporarily abroad who have not maintained a usual place of residence in Canada.

Population
Estimated population and population according to the census are both defined as being the number of Canadians whose usual place of residence is within that area, regardless of where they happened to be on Census Day. Also included are any Canadians staying in a dwelling in that area on Census Day and having no usual place of residence elsewhere in Canada, as well as those considered **non-permanent residents**.

Population estimate

a. ***Postcensal:*** Population estimate produced by using data from the most recent available census adjusted for ***census net undercoverage*** (including adjustment for incompletely enumerated Indian reserves) and estimate of the ***components of demographic growth*** since that last census. This estimate can be preliminary, updated or final.
b. ***Intercensal:*** Population estimate derived by using ***postcensal estimates*** and data adjusted for ***census net undercoverage*** (including adjustment for incompletely enumerated Indian reserves) of censuses preceding and following the year in question.

Population growth or total growth
Variation of population size between two dates. It can also be obtained by summing the natural increase, total net migration and if applicable, subtract residual deviation. It can be positive or negative.

Precocity error
Difference between preliminary and final estimate of a particular component in terms of its relative proportion of the total population for the relevant geographical area. It can be calculated for either population estimates or components of population growth.

Rate
Refers to the ratio of the number of events estimated in a year (t, t+i) to the average populations at the beginning and the end of the period. In this regard, births, deaths, immigration rates, etc. are calculated. Generally, the rates are expressed in per 1,000.

Census net undercoverage of population rate: Difference between the census undercoverage rate and the census overcoverage rate.

Demographic growth rate or population growth rate: Ratio of population growth between the year t and t+i, to the average **population** of both these years. The rate is generally expressed in per 1,000.

Overcoverage of population rate: The ratio of the number of persons who should not have been counted in the census or who were counted more than once to the total number of persons that should have been enumerated in the census. Generally, the rate is expressed in percentage.

Undercoverage of population rate: The ratio of the estimated number of persons not enumerated in the census (who were intended to have been enumerated) to the total number of persons that should have been enumerated in the census. Generally, the rate is expressed in percentage.

Residual deviation
Difference between demographic population growth calculated using intercensal estimates of population between two dates and that obtained by the sum of the components for the same period. This deviation results from the

distribution of the error of closure between years within the quinquennial period. This distribution is calculated by taking into account the number of days within each month.

Returning emigrant
Canadian citizen or ***immigrant*** having previously emigrated from Canada and subsequently returned to the country.

Total net migration
Sum of ***net international*** and ***net interprovincial*** migration.

Vital statistics
Includes all the demographic events (births, deaths, marriages and divorces) for which there are a legal requirement to inform the Provincial or Territorial Registrar's Office.

Appendix 2: Sources and remarks

Base population:

May 10, 2016 Census of Population adjusted for census net undercoverage and incompletely enumerated Indian reserves.

2016 Census: Statistics Canada, Census of Canada, 2016, Catalogue no. 98-501-X (https://www12.statcan.gc.ca/census-recensement/2016/ref/98-501/98-501-x2016001-eng.cfm).

Census net undercoverage: See The Daily, September 27, 2018.

Incompletely enumerated Indian reserves: See The Daily, September 27, 2018.

Births and deaths

Statistics Canada, Health Statistics Division.

Statistics Canada, Demography Division, Catalogue no. 91-002-X, Quarterly.

Births — Fertility rates for 2016 based on births by age group of the mother provided by Health Statistics Division applied to the female population estimates by age group at the beginning of the quarter. Births for Quebec and British Columbia were provided by their respective agencies.

Deaths — Mortality rates for 2016 based on deaths by age group and sex provided by Health Statistics Division applied to the population estimates by age group and sex at the beginning of the quarter. Deaths for Quebec and British Columbia were provided by their respective agencies.

Immigration

Estimates are based on the immigrant files provided by Immigration, Refugees and Citizenship Canada (IRCC) received on August 21, 2018.

Emigration

The estimates are produced by Demography Division using:

- data from Canada Revenue Agency (CRA) Canada child benefit files (CCB) program. The last year of data used is 2015/2016;
- tax data calculated using T1FF4 file provided by the Income Statistics Division of Statistics Canada. The last year of data used was 2015/2016;
- data provided by the U.S. Department of Homeland Security, Office of Immigration Statistics. The last year of data used was 2015/2016;
- data on the number of adult and children emigrants from T1FF4 file used for the provincial distribution of adults. The last year of data used was 2015/2016.
- For estimates after 2015/2016, we:
    - Calculated the 2015/2016 emigration rate for Canada;
    - Applied this rate to Canada's population on July 1st at the beginning of the period to be estimated;
    - Distributed the number of emigrants for Canada by the province and territory according to the provincial distribution of 2015/2016;
    - Distributed these data by month according to the provincial or territorial emigration seasonality of 2015/2016.

Returning emigration

The estimates are produced by Demography Division using:

- data from Canada Revenue Agency (CRA) Canada child benefit files (CCB) program. The last year of data used was 2015/2016;
- For estimates after 2015/2016, we:
  - Calculated the 2015/2016 returning emigration rate for Canada;
  - Applied this rate to Canada's population on July 1st at the beginning of the period to be estimated;
  - Distributed the number of returning emigrants for Canada by the province and territory according to the provincial distribution of 2015/2016;
  - Distributed these data by month according to the provincial or territorial returning emigration seasonality of 2015/2016.

Net temporary emigration

The intercensal estimates are produced by Demography Division using:

- data from the Reverse Record Check (RRC) of the 2016 Census;
- 2016 Census – question on the place of residence 5 years ago;
- estimates of returning emigrants for 2011 to 2016 intercensal period;
- For the postcensal estimates, we:
  - Calculated the 2015/2016 net temporary emigration rate for Canada;
  - Applied this rate to Canada's population on July 1st at the beginning of the period to be estimated;
  - The result for the year is distributed into monthly estimates using an applied seasonality that is an average between zero seasonality and the seasonality of emigration;
  - The monthly estimates are then distributed by province and territory according to the provincial distribution of the intercensal data.

Non-permanent residents

The estimates are produced by Demography Division using the Global Case Management System (GCMS) files from IRCC. These files, received on August 21, 2018, document the number of persons holding permits/ authorizations or claiming refugee status. Net data from July 2001 to June 2011 have been revised using the Field Operational Support System files (FOSS) files from August 19, 2015.

Interprovincial migration

The estimates are produced by Demography Division using:

- data from Canada Revenue Agency (CRA) Canada child benefit (CCB) program adjusted migration data for children;
- factors ($_{i}G$) corresponding to the ratio of the migration rate of all children to the migration rate of children who are registered to the CCB program calculated using 2016/2017 tax file data;
- factors ($_{jk}F$) used to calculate adult migration and corresponding to the ratio of the adult to child migration rates, calculated on a three-year basis using tax file data for 2014/2015, 2015/2016 and 2016/2017.

Note: Due to a change in methodology, we remind you that the in- and out- interprovincial migrants cannot be summed in order to obtain a different period (for example, the sum of the quarterly estimates is not equal to the annual estimates). This method has been applied starting with July 2011.

Related products

Publications

91-003-X	Canadian Demographics at a Glance
91-209-X	Report on the Demographic Situation in Canada
91-214-X	Annual Demographic Estimates: Subprovincial Areas
91-215-X	Annual Demographic Estimates: Canada, Provinces and Territories
91-520-X	Population Projections for Canada, Provinces and Territories
91-528-X	Population and Family Estimation Methods at Statistics Canada

Tables

17-10-0005-01	Population estimates on July 1st, by age and sex
17-10-0006-01	Estimates of deaths, by age and sex, annual
17-10-0008-01	Estimates of the components of demographic growth, annual
17-10-0009-01	Population estimates, quarterly
17-10-0014-01	Estimates of the components of international migration, by age and sex, annual
17-10-0015-01	Estimates of the components of interprovincial migration, by age and sex, annual
17-10-0016-01	Estimates of births, by sex, annual
17-10-0020-01	Estimates of the components of interprovincial migration, quarterly
17-10-0021-01	Estimates of the components of interprovincial migration, annual
17-10-0022-01	Estimates of interprovincial migrants by province or territory of origin and destination, annual
17-10-0040-01	Estimates of the components of international migration, quarterly
17-10-0060-01	Estimates of population as of July 1st, by marital status or legal marital status, age and sex
17-10-0045-01	Estimates of interprovincial migrants by province or territory of origin and destination, quarterly
17-10-0061-01	Estimates of the number of census families as of July 1st
17-10-0059-01	Estimates of the components of natural increase, quarterly
13-10-0708-01	Deaths, by month
13-10-0709-01	Deaths, by age group and sex
13-10-0415-01	Live births, by month
13-10-0416-01	Live births, by age of mother

Surveys

3231	Vital Statistics - Birth Database
3233	Vital Statistics - Death Database
3601	Estimates of Total Population, Canada, Provinces and Territories
3604	Estimates of Population by Age and Sex for Canada, Provinces and Territories
3605	Estimates of Population by Marital Status, Legal Marital Status, Age and Sex for Canada, Provinces and Territories
3606	Estimates of the number of Census Families for Canada, Provinces and Territories